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N.A.A. BULLETIN

May 1961 — In Two Sections — Section 1

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Accounting *and* —

- Human Relations
- Pricing Decisions
- Product Line Controls
- Cash Management

N.A.A. BULLETIN

Vol. XLII No. 9 MAY, 1961

Contents

— Five Sides of Accounting —

Page

HUMAN RELATIONS AND MORE EFFECTIVE REPORTING

by JAMES D. WILLSON

To make the operating people feel accounting reports upon their activity as *their* reports brings in not only the human touch, needed to motivate them, but also their contribution helps in producing more meaningful reports. This "people-oriented" approach to reporting is, in the author's opinion, a factor of paramount significance..... 13

FLEXIBLE COSTS FOR PRICING DECISIONS

by MORTON BACKER

The use of costs in pricing is viewed here as a practical matter, that of applying combined methods providing cost data sufficiently flexible to be useful under varying conditions, rather than formulating general principles for over-all guidance 55

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Page

ORIENTING CONTROLS TO THE PRODUCT LIFE CYCLE
by ALLEN H. SEED
Designed to take care of the shortcomings of functional controls, this is a procedural follow-up, focused on turning points in product life, where a decision is deemed needed in order to enhance the next phase in the cycle or to prevent decline. A few relatively simple yardsticks are offered to help in recognizing profit opportunities and originating action upon them 33

CASH MANAGEMENT FOR CONTROL OF INVESTMENT
by LLOYD W. SMITH
Since the cash flow is indicative of the profit realized, its control can be developed into an additional instrument of return-on-investment measurement and control, as presented in this article 5

MANUFACTURING EXPENSES — A BURDEN OR NOT?
by RAYMOND D. BEHRMANN
Rather a narrative than a case study, nevertheless to the point, the article deals with a rapidly growing small business and the accountant's coping with the need for a more adequate allocation of burden..... 79

— Profit and Control Charting —

A CRITICAL LOOK AT THE MARGINAL GRAPH TECHNIQUE by JOSEPH R. BURCHARD
The author argues the applicability of the marginal graph technique to manufacturing. The case study offered in the article supports this point of view through a comparison with the break-even chart technique 25

COST CONTROL CHARTS — AN APPLICATION OF STATISTICAL TECHNIQUES by DEWEY W. NEAL
Where it is important that variances and their causes be determined directly, not on an average basis, and spotted immediately, not on a weekly or monthly basis, the system recommended here will prove helpful, even though it will cost more to operate. The author illustrates all phases of the procedure by means of an easy-to-follow example..... 73

Page

— Cases in Financial Lines —

THE NEED FOR KNOWING COSTS IN BANK TRUST DEPARTMENTS by LEONARD L. RYNSKI

The author's starting point is that the fees for services offered by bank trust departments be determined on a sound basis and that they provide for a fair margin of profit. The elements of cost to be taken into account, the computation of fees and the recording needed are set forth in the article 39

APPROACH TO INTERNAL CONTROL IN THE SAVINGS AND LOAN BUSINESS by JOE G. HARRIS

This is a business in which proper functioning of internal control appears as a matter of major management concern. Along with the expansion of the savings and loan business, the need of adequate internal control and the recognition of it have been stepped up, as pointed out by the author 85

— Keeping Up to Date —

Cross Training for Developing Personnel

by EUGENE C. SCHUBERT 92

"Auditing Through" EDP Equipment

by ROBERT N. TROMBLY 67

Does the Accounting Profession Extend Beyond the Practice of Public Accounting?

by PATRICK S. KEMP 52

BEYOND THESE COVERS 94

Cash Management for Control of Investment

by LLOYD W. SMITH

FOR MANY YEARS the accounting profession has witnessed a continuous march forward in the development of the role of the accountant in management. The accountant has progressed significantly from "recording and classifying" to a vital place on the management team.

Through this period of evolution, means of evaluation such as profit planning, cost control programs, standard costs, work measurement, budgets, direct costing and a myriad of other control techniques have been designed to measure and appraise the results of a business enterprise. In the search for better methods to control profits, great pains have been taken to establish those which will identify responsibility for cost incurrence, sales volume, and production efficiency. It is worth considering, however, that all these programs are addressed primarily to the items making up the profit and loss statement. In other words, concentration has been on the cost-volume-profit relationship with integrated programs designed to ensure that controls have been established over all the elements of the profit and loss statement. Efforts have been largely directed to the control of the "percent profit on sales."

In recent years there has been a growing awareness in management and investment circles of the necessity of relating the net earnings of an enterprise to the capital employed in producing these earnings, to establish the significant rate of return on capital employed. This is not a new concept but rather a neglected one which provides a useful tool for measuring management performance and for improving profits.

Return on capital invested may be directly and readily determined on a company-wide basis from the accounting statements by dividing net earnings by the total assets as shown on the balance sheet. This ratio may serve a useful purpose by making possible a comparison with other companies in the same line of business, but this simple calculation does not indicate the areas in which improvements might be made, nor does it permit comparison of performance in the various plants or divisions of an enterprise. The return on investment is made up of two factors: (1) the margin of profit on sales and (2) the rate of

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LLOYD W. SMITH, Olean-Bradford Area Chapter (Jamestown, 1954), is Assistant Controller of Clark Bros. Co., Olean, N. Y., a Division of Dresser Industries, Inc., with which company he has been associated in various capacities over the past fifteen years. He is a member of the faculty of St. Bonaventure University. Mr. Smith attended Cleveland College for advance work in accounting.

turnover of capital employed. It may be measured by multiplying the ratio of earnings to sales (profit margin) by the ratio of sales to capital (rate of turnover):

$$\frac{\text{Profit}}{\text{Sales}} = \text{Profit } \% \qquad \frac{\text{Sales}}{\text{Average investment}} = \text{Investment turnover}$$

$$\text{Profit } \% \times \text{Investment turnover} = \text{Return on investment } \%$$

	Profit %		*Investment turnover*		*Return on investment %*
	10	×	2	=	20
(Increase turn)	10	×	2.2	=	22
(Increase profit)	11	×	2	=	22
(Increase both)	11	×	2.2	=	24.2
(Decrease both)	9	×	1.8	=	16.2
(Decrease profit, increase turn)	9	×	2.2	=	19.8
(Increase profit, decrease turn)	11	×	1.8	=	19.8

It will be noted that when the trend of both these factors follows the same direction, the effect on return is magnified. When the two trends are opposite, the effect on return is neutralized to about the extent of the lesser trend.

Notice that a 10-percent increase in return on investment can be obtained either by increasing the investment turnover by 10 percent or by increasing the profit percentage by 10 percent. It is obvious, therefore, that a satisfactory return on investment may be achieved either by relatively high margin of profit accompanied by a relatively low turnover of capital, as in many heavy goods industries, or by a low margin of profit accompanied by a rapid turnover of capital, as in light manufacturing or the retail trade. This relationship is further clarified by the diagram shown on Exhibit 1, which points out the integral relationship of return on investment to profit. The items reflected on the lower half of the exhibit, such as sales, manufacturing costs of sales, selling expenses, etc., have long been subjected to careful controls: various methods of sales analysis have been developed for control of product mix and volume, budgets have been developed for control of manufacturing costs and other expenses, standards are frequently integrated with the cost systems for control of efficiency, price variances have been developed for purchased materials, various allocations are used for measuring profit performance by markets, product lines, and so forth. But consideration should also be given to classifying transactions as to

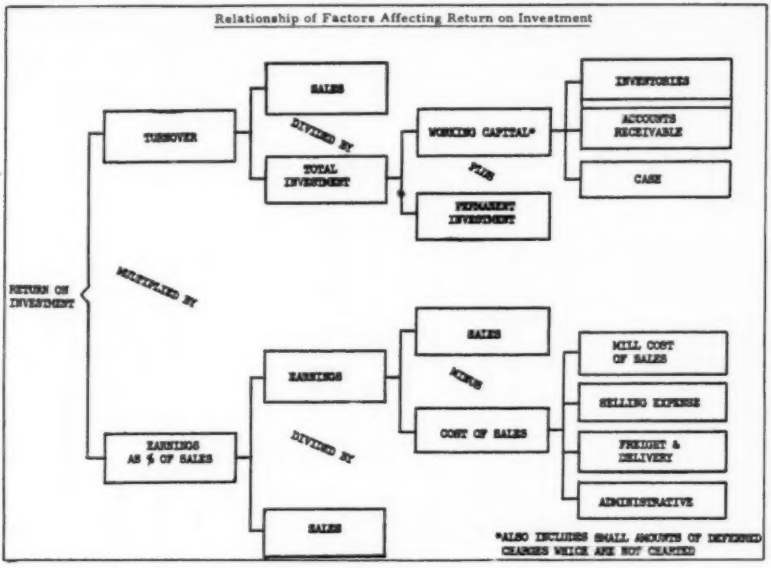

EXHIBIT 1

cash receipts and cash disbursements. This classification is sometimes provided for use in the statement of source and application of funds, which is usually done after the fact, however, instead of for use in day-to-day operations.

It might be said that the rate of return on any investment can be determined only when the cash invested has been returned to the investor along with the additional cash generated by the venture. Profits must be realized in cash. Exhibit 2 shows a very simple diagram of the cash flow cycle. Notice that the items which stand out are those which represent investment: cash, plant, inventories and receivables. Time is also indicated as the cash changes form while converting from one asset to another. Emphasis on the flow will highlight the excess capital residing in each of these areas and spur action to reduce the over-all investment. The very words, cash flow, indicate movement; therefore, cash planning is not static nor can a balance sheet be used to control interim changes in investment. Forward planning for inventories must be developed so that the flow of cash into inventories through plant, materials and other costs can be measured against actual expenditures as they are incurred. A study of accounts receivable will produce an interim schedule which will enable weekly

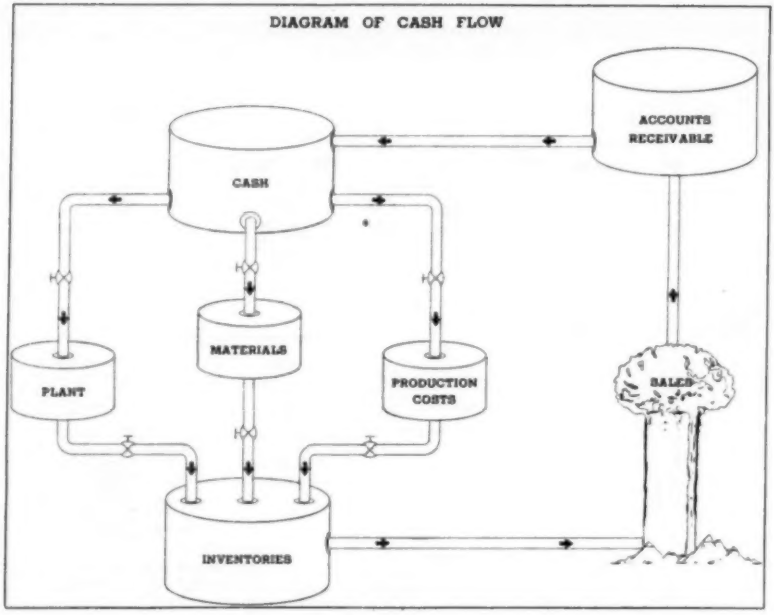

EXHIBIT 2

or daily comparisons to be made so that collections can be anticipated and integrated in the cash flow cycle.

Programs such as profit planning, forecasting and budgeting, already in use, can be extended to exercise control of cash flow, resulting in reduced capital being employed. Even in well organized businesses the major emphasis is placed on the statement of earnings in preparing a profit plan or forecast. Usually the balance sheet ends up being no more than a projection incorporating the net earnings anticipated. The same careful planning should be followed in determining the flow of cash through the forecast cycle so that the resultant balance sheet not only reflects the investment at various intervals of time but that the underlying balance sheet work papers also provide the detail needed to compare interim transactions affecting investment, and spark corrective action when results deviate from the planned course.

Exhibit 3 shows a cash forecast statement designed to focus continual attention on cash flow so as to initiate action daily. Columns are provided for projecting the current month by weeks and each of the two succeeding months by month. This statement should be revised on a weekly basis, incorporating

EXHIBIT 3

CASH FORECAST
PERIOD ENDING MARCH 31, 1961
$000 OMITTED

	ACTUAL	WEEKS BEGINNING				MONTH OF			
	1/1 - 1/7	1/8	1/15	1/22	1/29	JAN.	FEB.	MAR.	TOTAL
CASH BEGINNING OF PERIOD									
CASH RECEIPTS									
REGULAR ACCOUNTS									
ADVANCE PAYMENTS									
NOTES									
TOTAL CASH RECEIPTS									
TOTAL CASH AVAILABLE									
CASH DISBURSEMENTS									
PAYROLLS									
DISCOUNTS									
NETS									
CAPITAL									
OTHERS									
TOTAL CASH DISBURSEMENTS									
CASH END OF PERIOD									
PER FORECAST									

known changes from the previous quarterly forecast. The use of a statement of this kind reduces the margin of error in cash forecasting by providing for listing of every known fact and constant review of those items which are questionable. The following paragraphs present brief description of the methods employed in developing and using the weekly cash forecast.

Cash Receipts

Each order is analyzed, segregating those on which special terms have been granted, such as advance payments to be received, notes to be accepted as payment or delayed payment beyond normal terms. Continuing schedules are maintained on advance payments and notes to be received or to be applied against receivables as shipment is made. These two schedules provide the projected receipts for advance payments and notes.

Collection of regular accounts may be forecast by combining open invoices, over a significant amount, and projected sales for the period. These are accumulated on a schedule by month in which billing did or will occur. The figures are then adjusted for the special terms mentioned above. A formula, that can be developed statistically is then applied, which assumes collection of a predetermined percentage on each month's billing in the month billed, plus a declining percentage in each of the succeeding months, depending upon experience. After extending the schedule, the special term items are added and also a flat amount is added for items under the significant amount previously established. Open invoices over the significant amount are reviewed for apportioning the current month's receipts by weeks. The following example will illustrate the use of this technique, assuming collection of 70 percent in the month billed and 15 percent in each of the two succeeding months:

Month	*Sales*	*Less: Special terms*	*Accts. rec.*	*Jan.*	*Feb.*	*Mar.*	*Apr.*	*Etc.*
Nov.			15	15				
Dec.			40	20	20			
Jan.	100	10	90	63	9	8		
Feb.	150	20	130		91	20	19	
Mar.	110	10	100			70	15	
Etc.								
	360	40	375	98	120	98	etc.	
Special terms				5	30	5	etc.	
Total				103	150	103	etc.	

Cash Disbursements

Pay rolls are estimated on the number of pay periods in the forecast and the manpower projection. Discounts and net amounts are projected on the basis of experience and projected purchase commitments. Capital expenditures are estimated based on the capital budget and open purchase commitments. Other expenditures, which include pay-roll taxes and other fringe benefits, commissions, etc. are projected in detail by category.

Intelligent application of cash forecasting dictates that there must be a control over cash employed and, in order to have control, responsibility must be assigned. Responsibility can be established for control of investment through decentralization of accounting. This can be done by setting up semi-autonomous accounting functions within major plants or product divisions or it can be done informally by expansion of the chart of accounts to accommodate the necessary breakdowns of investment by product division within a centralized accounting group.

Each product division is responsible for its own sales, margin contribution, manufacturing costs and other capacity costs, all of which ultimately reflect controllable earnings. The product division is also responsible for its investment including receivables, long-term notes, inventories and fixed plant. All this data pertaining to performance with respect to control of investment can be directly assigned to the product division through proper use of the chart of accounts and decentralization of accounting functions.

Control of Investment

Considering cash, it seems trite but true to say that there are basically three avenues of control for excess cash: (1) distribute it to the stockholders, (2) invest it in short-term obligations such as treasury bills or (3) invest it in new plant facilities which will earn an adequate return.

Control of receivables takes many forms. Certainly bad credit risks should be avoided but, assuming the receivables are on the books, some other steps can be taken. A monthly report showing all accounts over a significant amount which are past due might be given to the product manager. The product manager must then assume responsibility for follow-up with field sales organizations to determine the reasons for the past due amounts and to decide what settlement can be arranged in the event of a disagreement between the customer and the company. Of course, it is assumed that a standard course of action to prevent accounts from becoming past due is already in practice. The important feature

is that the product manager is responsible for both the investment and for taking action to reduce it. He should be assisted by the financial department but final responsibility is his.

Companies serving the foreign markets recognize that long-term financing must be given more consideration if they are to be competitive with the foreign manufacturers. Thus a company may have considerable long-term notes receivable on its books and believe that they are yielding an adequate return in the form of interest; however, when we apply the cash-flow technique to a transaction of this kind we find that the time cycle involved produces a return much smaller than the return which would be considered adequate under normal circumstances.

Summary Conclusion

The point to be emphasized is that cash flow into and out of the business enterprise is really the final yardstick by which success or failure is measured. It is not enough to simply establish controls over the profit and loss statement. Certainly it is desirable to establish cost control programs and to develop techniques to increase profits but, if we are able to recognize the simple precept that profits must be realized in cash, then it follows logically that some form of concentration on the control of cash flow should be implemented. This control program should employ the same principle as any other control program, i.e., identification of responsibility for control of the various elements affecting cash flow. Further, these elements must be controllable within some predetermined standards or yardsticks. The extension of responsibility for control of cash flow should be no more difficult than extension of responsibility for control of profit. The control of cash is a continuous daily task. This is so because the flow of cash is dynamic and proportionate to total business activity.

Development of a formalized continuous cash control program offers several advantages:

1. Results in improvement of return on investment.
2. Focuses attention on collection of receivables.
3. Engenders sound fiscal policy by having cash available when and where needed.
4. Creates a climate in which sales, engineering and manufacturing personnel are invited to share responsibility for company fiscal policy.

Human Relations and More Effective Reporting

by JAMES D. WILLSON

ONE OF THE CAUSES of ineffective reporting is insufficient emphasis on its human relations aspects. In our concern to report facts and in our zeal to be impartial, we very often ignore the human aspects because the technical facets seem so much more important. Yet, business organizations are composed of people; people plan or fail to plan a course of action, people control or do not control costs and expenses, people make business decisions. This paper, therefore, emphasizes some of the human relations aspects which, in experience, should be carefully weighed in developing an efficient *people-oriented* reporting system.

Many of us are employed in medium or large businesses where reports pretty much are taken for granted. When the business grows and expands, close personal supervision is necessarily lost in large degree. Other means of control and information dissemination become necessary—accounting and statistical reports.

Most of us recognize this evolution—the transition from personal, first-hand knowledge to reliance on the more impersonal reports—as the result of the specialization of labor inherent in complex organizations. But do we fully realize what we accountants, as report specialists, can do to regain some of the advantages inherent in the small business and its close personal contact between boss and co-worker?

Reports to Motivate People

A significant factor in improving performance is properly motivating people so that each individual strongly desires to perform better. First, each worker must realize that the task he is doing is identifiable and worthwhile. Second, his accomplishments must be recognized and approved by others (his immediate boss as well as other higher-echelon persons). Third, he must see the relationship betwen his work and the finished product of the company. In short, the man must feel that he is identified and recognized through his work; he must

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JAMES D. WILLSON, Los Angeles Chapter (New York, 1938), was recently promoted to the position of Vice President-Finance of Tidewater Oil Company, Los Angeles, California. Mr. Willson, a previous contributor to the *Bulletin*, is recipient of three Certificates of Merit and a Lybrand Gold Medal (1958-1959). He is a co-author of "Business Budgeting and Control" and "Controllership, the Work of the Accounting Executive," published by The Ronald Press Company.

have a pride of accomplishment; and he must be made aware of his role in the organization. The reporting system can aid in doing this. In developing a reporting structure which recognizes these human relations factors, several simple yet important principles may be utilized. Some are old, but need re-emphasis; others may seem new.

Responsibility Reporting

First, consider the scope of a report. Since a man is inclined to think of *his* job, *his* initiative, *his* action, the report should cover *his* sphere of responsibility. This is known as "responsibility reporting" and the adequate handling of the accounting is known as "responsibility accounting." The concept embraces a dissemination of facts concerning revenues and costs attributable to the segment of the organization being reported upon. It signifies a communication about costs which can be controlled by the person being reported on, or which are attributable to his efforts or function. Such a system avoids the allocation of costs for control purposes to an organization unit which does not control them and cannot be held accountable for them.

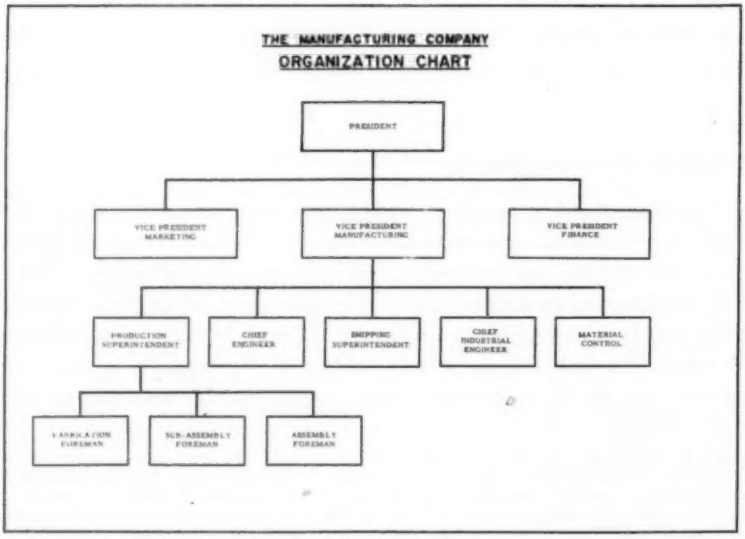


EXHIBIT 1

The reporting system follows the organization chart. As a first step in the procedure, the lines of responsibility and the responsibility areas must be identified. In other words, each block in the organization chart should represent a segment to be reported upon and to receive reports on the functions responsible to it. Conversely, any report prepared according to this concept should easily fit into one of the blocks in the organization chart.

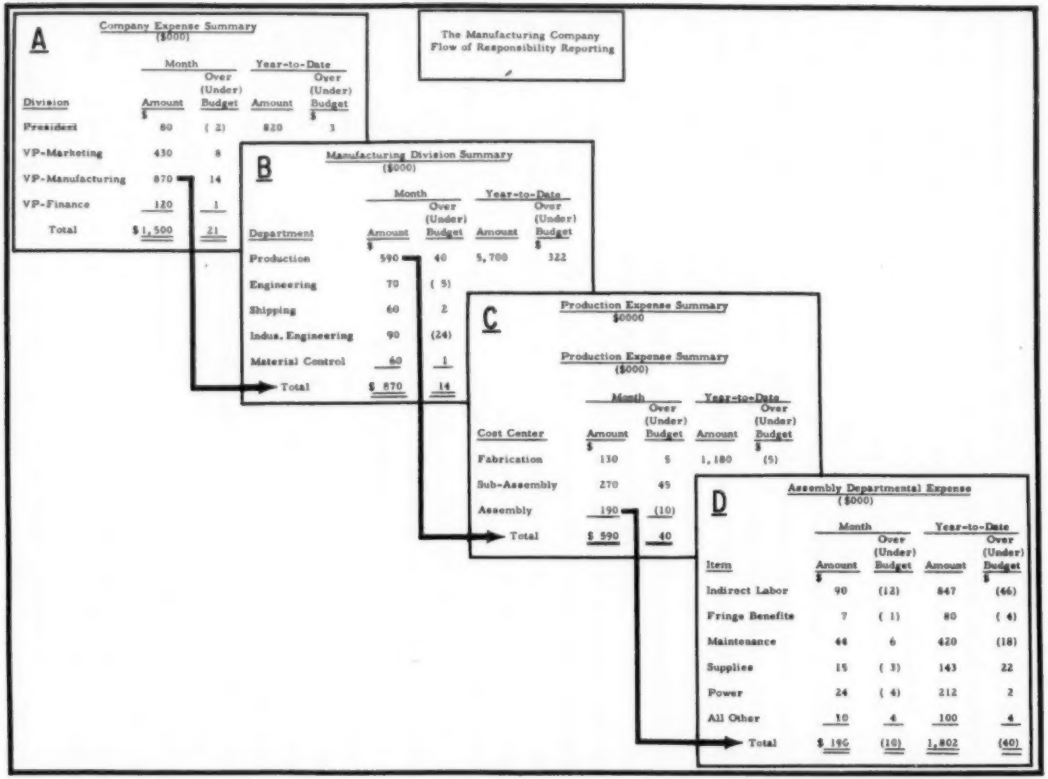
As an example, consider the simplified organization chart shown in Exhibit 1 in conjunction with a responsibility-oriented series of reports. The president, who is accountable for the entire business, would receive an over-all expense summary, segregated by the functions incurring such expenses and assignable to the individual whom he holds responsible. Such a simplified report is shown as Item A in Exhibit 2. This document reflects the expense performance, compared to budget, for each top responsibility area, viz. the president's own department, and that for each immediate subordinate.

Following the same principle of reporting, each person accountable to the president would receive a summary report on the expense performance of *his* division as well as such detailed supporting schedules he felt necessary. In our example, the vice president-manufacturing would receive an expense performance report matching the five responsibility areas of his division, as shown in Item B of Exhibit 2. Under this scheme, and continuing progressively lower in the organization structure, the production superintendent would secure a statement of expense performance for each responsibility sector reporting directly to him. Item C of Exhibit 2 summarizes the expense story for the three areas for which he is held accountable: fabrication, sub-assembly and assembly. Finally, the foreman in charge of a department would be provided with *his* expense story, as reflected in Item D of Exhibit 2. Each manager could receive such further detailed reports as he wished, each one reflecting an area of assigned responsibility, accountability and authority.

Exhibit 2 is designed primarily to illustrate an expense reporting structure for each level of responsibility, and the relationship of a given report to that of the next higher echelon of responsibility. It may be helpful, however, to comment on some of the other features which very often are contained in a good communication system:

1. Accounting classifications are kept to a minimum with the objective of pointing out important figures and avoiding minutia. Thus, in Item D of Exhibit 2 all expenses which are not significant individually have been grouped under "all other." Such aggregations may be changed from month to month, and from department to department, as circumstances warrant.

2. Actual cost performance is compared with an acceptable measure



A Company Expense Summary ($000)

Division	Month Amount $	Month Over (Under) Budget $	Year-to-Date Amount	Year-to-Date Over (Under) Budget $
President	80	(2)	820	3
VP-Marketing	430	8		
VP-Manufacturing	870	14		
VP-Finance	120	1		
Total	$ 1,500	21		

B Manufacturing Division Summary ($000)

Department	Month Amount $	Month Over (Under) Budget $	Year-to-Date Amount	Year-to-Date Over (Under) Budget $
Production	590	40	5,700	322
Engineering	70	(5)		
Shipping	60	2		
Indus. Engineering	90	(24)		
Material Control	60	1		
Total	$ 870	14		

C Production Expense Summary $0000

Production Expense Summary ($000)

Cost Center	Month Amount $	Month Over (Under) Budget $	Year-to-Date Amount	Year-to-Date Over (Under) Budget $
Fabrication	130	5	1,180	(5)
Sub-Assembly	270	45		
Assembly	190	(10)		
Total	$ 590	40		

D Assembly Departmental Expense ($000)

Item	Month Amount $	Month Over (Under) Budget $	Year-to-Date Amount	Year-to-Date Over (Under) Budget $
Indirect Labor	90	(12)	847	(46)
Fringe Benefits	7	(1)	80	(4)
Maintenance	44	6	420	(18)
Supplies	15	(3)	143	22
Power	24	(4)	212	2
All Other	10	4	100	4
Total	$ 190	(10)	1,802	(40)

EXHIBIT 2

of performance, the budget, rather than the prior month or the same month last year.

3. Costs, by responsibility area, are compared to budget for the year-to-date as well as the single month. In many categories, such as maintenance, the cumulative cost performance may be more significant than the results of an individual month.

4. The report is kept simple by rounding off the figures. The "exception principle" of reporting could be employed, by providing data only when cost performance departs from the standard by more than a given percent, such as two percent.

To repeat, an important reporting principle is that revenues and costs must be identified by responsibility area and be reported upon as such. If a man is to exercise sound judgment, he must be fully informed on what is happening or is likely to happen in his area of accountability. Therefore, successful responsibility reporting requires that he receive the *important* facts about his activity. The report must tell about the performance of the man held accountable. It should show the results of that person's part of the business, as if he were running his own; and the story should be told without confusion or complications by reason of the action of others. The identification of results with an individual—that is responsibility accounting.

Full Understanding by Supervisor

It is perhaps elementary, but often overlooked, that if a written communication—a report—is to be effective, it must be *understood*. People distrust what they do not understand. They fear the unknown. It is, therefore, imperative that the person receiving a report be fully informed as to the contents. Each figure should be clear as to its meaning, and its significance easily comprehendable.

There are several helpful things we accountants should do preparatory to the issuance of a new report. As a preliminary step, the concepts underlying the report should be explained. The source of the actual figures, the degree of accuracy, or extent of lag, etc., should be discussed with the people who will use the report. For example, if vendor invoices are the basis of charges, the currency of the information should be commented upon. If accruals are used, or estimates included, the practice and the way it affects the report should be talked about. In those instances where standards of performance are a basis of comparison, the composition of details should be made known. In short, the full significance, the weaknesses and the benefits of the report must be understood by those using the document. Only when this has been accom-

plished can the report do the most good. Time taken in these preparatory steps will be amply repaid through the conservation of the time of the reader, and the time of the accountant in continually explaining (and defending) the figures.

Developing Standards

Brief comment already has been made about comparing cost performance against an acceptable measure or yardstick. From the human relations viewpoint, the manner in which these measures are constructed is significant. Properly developed, the standards are an effective tool. Improperly built, these standards can be a cause of increased irritation, and the growth of friction between higher management and those being measured.

It will bear pointing out that the measurement of performance presupposes a yardstick of desirable results with which actual results may be compared. In searching for such a measure, the use of past performance is natural, but such a comparison does point out trends, and it serves also to perpetuate inefficiencies. Therefore, rather than compare with only historical results, the practice of developing better standards has grown extensively.

The basic question, however, is "Who should set the standards?" Standards should be set by those who are best qualified, by training and experience, to judge what constitutes good performance. Inasmuch as standards may be developed for many activities, many organizational segments are involved. Quite often it is a joint process requiring the cooperation of two or more divisions of the business. For example, sales standards might be set by the market research group in cooperation with the accountants. Or, manufacturing standards could be set by the industrial engineers, perhaps with the aid of the cost accountants. In principle, the standards of performance should be set as the result of careful study and analysis.

It is important that standards should not be set by those whose performance is to be judged. From the control standpoint, an independent approach is necessary. But—and this is significant—the proposed standards should be reviewed with those who are to be measured; the composition, in every respect, of the yardstick should be understood by them, their suggestions should be considered, and every effort made to arrive at a *fair* answer. When this simple precaution is taken, a psychologically more sound answer should result. By and large, most individuals, if properly approached, will give their assent to a fair and reasonable yardstick of performance. They will accept measurement against it; they will make a greater effort to attain the desired goal.

Interpretation by the Operating Executive

A fourth important consideration in an effective reporting system is a "his report" attitude. The key word is participation. The method of securing the best results is by seeing that the individual reported upon gives his story. To be fully effective it must be his report, not the accountant's report or spy sheet (or whatever he may call it).

We should expect the accountant to secure the facts and prepare the significant comparisons of *what* happened, or probably will happen. But, in general, it is preferable that the responsible supervisor discuss *why* it happened, and *what he is doing in the way of corrective action.* On this basis, a report is a team project. Although the accounting department provides the figures and some of the interpretation, the executive responsible for the activity gets *his* story to *his* boss. Such a report is illustrated in Exhibit 3. An attempt is made to encourage the department manager to briefly tell about steps he has taken to get costs and expenses to the proper level and to indicate probable future trends of expenses as a result of projects initiated in his department. The participation by the department manager in explaining his performance to his superior increases the value of the report.

Consider briefly the steps in the preparation of such a report. First, of course, the accounting organization determines the actual figures and calculates the budget (which is the standard or acceptable performance for the level of activity which has taken place).

In this example, the procedure included isolating the important areas of better-than-budget and worse-than-budget performance. By mutual agreement, it was decided previously that any variance over $2,000 should be disclosed, as well as any excess cost of 2 percent or more. The expenses which were close to budget and therefore needed little attention, were grouped in one figure.

As a next step, the accountant assigned to analyze the costs of the milling department, reviewed the figures, determined the few comments which should be made to highlight what happened and quickly evaluated the dollar results. Then, having checked the figures for accuracy, and armed with all important detailed supporting information, the accountant sits down with the department manager to review the results. He answers any questions Jones has, and points out any condition or trend which he feels significant, as gained through the analysis of the data.

Now, and very important, the milling department manager, with his knowledge of the operation, and supported by a factual presentation of actual results, prepares some brief remarks explaining the cause of the nonstandard operations.

THE XYZ COMPANY
BUDGET REPORT

Month: December, 1960

Dept. 112 Milling
Dept. Manager John Jones

Description	Month		Year-to-Date	
	Actual	Over/(Under) Budget	Actual	Over/(Under) Budget
Better than Budget*				
Indirect Labor	$ 15,900	(1,310)	186,100	$ (8,900)
Supplies	6,420	(220)	74,800	(1,050)
Power	17,800	(540)	201,300	(3,700)
Sub-total	40,120	(2,070)	462,200	(13,650)
Worse than Budget*				
Direct Materials	286,300	8,360	3,617,000	82,100
Maintenance	33,100	3,190	304,100	21,800
Sub-total	319,400	11,550	3,921,100	103,900
All Other	11,310	200	143,620	700
Total costs & expenses	$ 370,830	9,680	4,526,920	$ 90,950

* By 2% or $2,000 or more, whichever is lower

COMMENTS

Accounting

Expenses were over budget by 2.68%, which is slightly higher than the 2.05% over-run for the year-to-date.

Although severe operating problems occurred on the No. 9 and 10 mills, good scheduling of indirect labor, particularly the cleaners, by John Jones has saved $1,310 for the month and $8,900 for the year-to-date.

Operating

Impurities in the melamine were responsible for a 2.9% loss of material over budget out of a total loss of 3.01%. This same condition also resulted in heavy scoring of the No. 10 mill. Out of the total excess costs of $11,550, it is expected that $10,000 can be recovered from the supplier.

Institution of the new screens is expected to be complete by Dec. 8 and resulting material savings should approximate $200,000 annually at the present rate of operations.

A change in source of felts is expected to reduce maintenance expense to budget.

EXHIBIT 3

He would, naturally, indicate what corrective action has been taken, or what is expected to be done. The explanation is given to the accountant who incorporates it in the expense budget report.

Joint effort of this nature, where the accountant reports *what* happened, and the operating supervisor indicates *why* performance was substandard, and what

he has done or intends to do about it, promotes the effectiveness of the reporting and of the budget. And when the procedure is well established, it need not be time consuming.

Timing the Report Distribution

Another factor not too often thought about, but of high value human relations-wise, is a simple matter of properly timing the report distribution. Everyone is aware, generally speaking, that reports must be issued quickly, to be of maximum value. We believe there is merit to arranging for the individual reported upon to receive the report on his operations *before* his superior does. Under these conditions, he may take corrective action immediately—which is the prime purpose of the control report—and be prepared to answer questions when the supervisor calls. Both he and his superior can have the report fairly quickly after the event.

The suggested procedure stimulates action free of a negative attitude which quite understandably arises if the manager has not had an opportunity to review the performance figures before being asked questions. It also has the advantage of placing the department supervisor in the position comparable to directing his own business—he takes action on his own initiative before being requested to do so by higher authority.

Such an arrangement is not always feasible; there will be occasions when a superior will insist on receiving the report before his subordinate does. To the extent that this attitude is occasioned by the failure on the part of the lower echelon to act, perhaps it is justified. Where the timing is based largely on a desire to know ahead of the other fellow, the accountant has a selling job to do.

Joint Development of Report Format

Another aid or key in securing favorable reaction to a reporting system is the method used in developing the report form itself. An individual is more favorably disposed to a procedure if it contains his ideas. Therefore, it is prudent to solicit and incorporate in the format the suggestions and thinking of those being reported upon. To be sure, since a certain uniformity in reporting must exist, each document cannot be individually tailored but, within reasonable limits, much can and should be done. Some of the features in which the operating viewpoint might dominate include these:

1. *Layout.* The order or sequence in which the facts are presented could be the one normally followed by the manager in his own thinking processes.

EXHIBIT 4

Illustrative Company

New York, New York
April 15, 1960

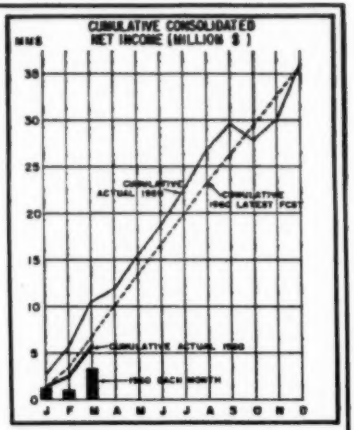
Report on Operations - First Quarter - 1960

Consolidated net income from the Illustrative Company for the first quarter of 1960 aggregated $5,932,000. This represents a 95.8% achievement as measured against the quarterly forecast net income of $6,193,000. However, it is to be noted that these earnings are substantially lower than the $10,463,000 earned in the corresponding period of the preceding year.

Comparative Division performance is shown on the accompanying Division Summary. However, it should be stated that all Divisions except New England exceeded both forecast and the prior year performance. This latter territory, beset by labor difficulties, was under forecasted earnings by $2,800,000. Fortunately, the other Divisions performed better than expected, so that consolidated first quarter results were within the 95.8% of the company objective.

Operating results for the month of March and the year-to-date are substantially close to forecast because these projections did not assume standard performance. A review of the net sales by territory indicates sales allowances aggregating $6,532,000. Moreover, the controllable expenses over standard reached a high total of $2,313,000. Territorial profit analyses in these areas should result in market action which will permit the remaining nine months of the current year to be more nearly in line with performance experienced in the last three years.

It is to be observed in reviewing the attached income statement that the return on shareholder equity is 8.2% on an annualized basis, as compared with an average industry experience of 6.4%. We believe that the completion of the Newport facility, through the better utilization of by-products, will bring the average return on shareholder equity up to a level of about 9.6% by September of the current year. On such a basis it is believed the consolidated net income will approximate $38,000,000 for the current fiscal year.



Consolidated Net Income
Statistical Tabulation
($M)

Month & Yr-to-date	This Year	Forecast	Last Year
Jan. Mon.	1,230	1,230	2,760
Y/D	1,230	1,230	2,760
Feb. Mon.	982	1,210	3,080
Y/D	2,212	2,440	5,840
Mar. Mon.	3,720	3,753	4,623
Y/D	5,932	6,193	10,463

2. *Terminology.* The terms used preferably should be those familiar to the operating people, not technical accounting jargon.

3. *Units.* If the operating people think in terms of physical rather than monetary units, performance could be so expressed. Under some circumstances it will be desirable to include both. There will also be times when different units are not comparable, and then a common denominator, such as dollars, will be required.
4. *Type of Presentation.* The type of presentation should be suited to the executive who will use it. Statistical, graphic or narrative form, or a combination of these, may be used, depending on which is most effective in getting the story across.

A simplified example where all three types of presentation are combined is shown in Exhibit 4. The graph readily indicates trends, the tabulation provides underlying specific data, and the narrative highlights the more important conditions. The comments incorporate significant information gained from various analyses, and are not restricted to a recital of facts given in the tabulation. This approach has the advantage of quickly setting out the meaningful data without the need of providing an exhaustive amount of detail (which may not be read). If the accountant finds that the line executive must have the supporting tabulations, these can be provided.

Exhibit 4 indicates over-all profit performance for the company. However, graphic techniques may be used advantageously for any segment of responsi-

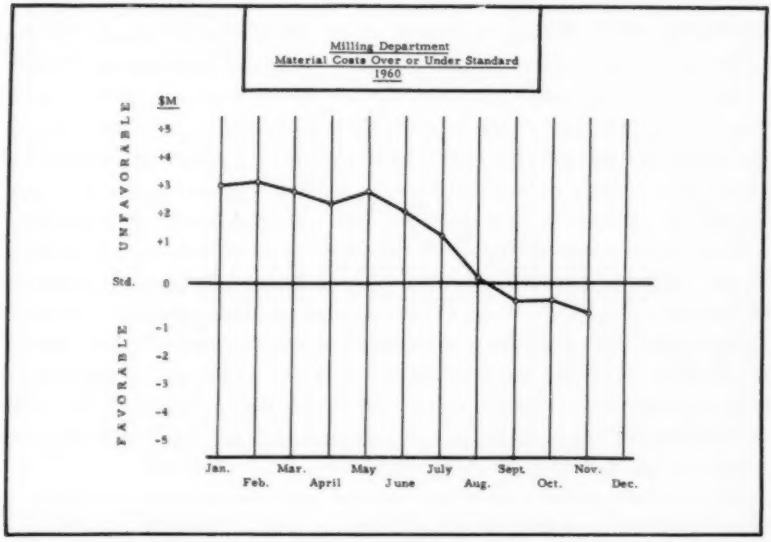


EXHIBIT 5

bility. As an example, if material losses over standard are a major source of waste for a given department, a graph plotting this performance, and showing the monthly trends, may be used as another aid in helping the departmental manager get the cost on course. Such a simple graph shown in Exhibit 5 measures the performance against standard. Such a report need be used only until the cost is under control and may then be discontinued. In using any of these techniques, of course, our objective is to get the story understood, to permit the reader to grasp the significant facts.

The Accountant's Role

We have expressed some ideas about very simple, but important, human value considerations in building a most effective management tool. There are many other principles not reviewed, but they are of a more technical nature and less closely related to a "personalized" approach. We have emphasized the human relations factors which contribute to effective reporting.

Control through the use of reports arises when close personal supervision of all the activities becomes impossible for the owner or manager. Because such reports are more impersonal, the human touch is needed to keep within employees at all levels the entrepreneur attitude about "his" part of the business. People can be motivated to perform in a better manner than otherwise, where report control techniques are necessary, if this system is "people-oriented."

Responsibility accounting and reporting, a well recognized principle, is the proper basis for a sound reporting system. Where the accountants' efforts result in a full understanding of reports by the operating people, when the operating people participate in the organizing and interpretation of "their" reports, and when the timing of the report distribution is proper, then the goal of the report is more likely to be achieved. The objective is to get the report wanted, desired, and considered in a favorable light. As accountants, our satisfaction will come in seeing that the reports contribute to the profitability and strength of our company. However, our role is always that of the impartial portrayer of the facts. Regardless of the technology used to secure maximum advantage from a report, our obligation to management and to the owners is to see that all salient facts, or trends and relationships—however unpleasant or unfavorable —are brought to the attention of the proper authority. In so doing, we fulfill our professional responsibility, yet we can do it in a more digestible or palatable form and, therefore, more successfully.

We can take pride in knowing that we have contributed to a reporting system which has become the means of liberating the full potentials of human ingenuity in our free enterprise system.

A Critical Look at the Marginal Graph Technique

by JOSEPH R. BURCHARD

IN THE PURSUIT of profit, the unceasing travail of business enterprise, the vital determinant is the relationship between volume and cost. There are two different methods of interpreting this relationship: the marginal graph and the break-even chart. The first was developed by academic economists and is presently taught in our colleges and universities; the second was conceived by business analysts and is widely used today by business management and industrial engineers. Do these diagnoses, despite differences in terminology, come to the same conclusion about cost and volume? If not, which one is the more useful for business management? Which one explains better the operations of the business firm? Which one is right?

Marginal Graph vs. B-E Chart

The marginal analysis tells us that the volume at which profit is the greatest is the one where marginal revenue and marginal cost are equal—marginal meaning the sales price or cost of an additional or the last unit produced. The firm should increase production until the cost of producing an additional unit is equal to its price. In graphic form, assuming perfect competition, the concept appears as in Exhibit 1.

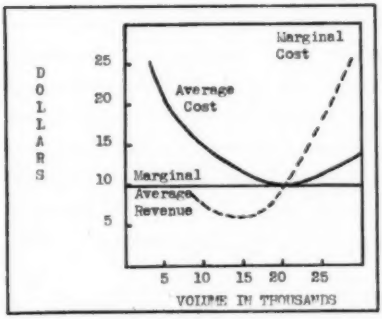


EXHIBIT 1

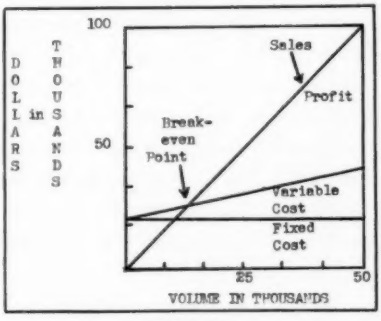


EXHIBIT 2

JOSEPH R. BURCHARD, C.P.A., is Controller of Empire Industries, Inc., Los Angeles, California. He taught Marginal Analysis as Assistant Professor of Economics at Western Reserve University, Cleveland, Ohio, for several years after World War II.

It is assumed here that the firm would maximize its gross profit at an output of 20,000 units. Under conditions of perfect competition the output of a single firm is considered so small with respect to the total output of the industry that it would have no effect on price. Price per unit, or average revenue, which is $10 in our example, would be the same regardless of output and appears in the diagram as a straight horizontal line. Since price is the same regardless of volume, the amount received for each additional unit, or marginal revenue, would be equal to the average revenue.

The break-even chart expresses the volume-cost relationship differently. It tells us the volume required at a given price "to crack the nut," that is, to cover costs. Crucial is the relationship between variable and fixed costs. The higher the level of fixed costs, which do not vary with volume, the greater will be the volume of sales necessary to cover costs. In the example shown on Exhibit 2 the break-even volume is 12,500 units.

The basic difference between the two analyses is apparent; it is in the point of maximum profit. The break-even chart shows profit maximized at full capacity. On the marginal graph this point is unrelated to capacity; profit is maximized where marginal cost and marginal revenue are equal. The reason for this difference can be seen in the diagrams themselves. The marginal graph utilizes curves; the break-even chart, straight lines. Graphically, a straight line represents a constant relationship. In the above break-even chart, the cost of producing an additional unit is 40 cents, regardless of volume; the relationship is constant. The dish shape of the marginal cost curve indicates that the relationship between volume and variable cost is not constant. Variable cost per unit at first decreases but, as volume increases, levels off, and then increases sharply. Are variable costs of the firm constant or increasing? That is the question that causes the basic disagreement between the two analyses. The pursuit of profit takes different paths. If variable costs are increasing, to maximize profit, management must locate the volume where marginal cost and marginal revenue are equal. If variable costs are constant, full capacity automatically provides the maximum profit; the important operating facts for management to know are the break-even volume and the degree of its fixed costs. The difference between the two analyses is fundamental. They are not compatible.

An Illustration of the Point in Question

To determine whether the variable costs of a business enterprise are constant or increasing, let us examine the accounting records of an actual firm. From

these records both a break-even chart and a marginal graph will be prepared. This firm, called the Reliance Company, manufactures and sells nationally a home appliance wholesale for $125.00. During the eighteen-month period under examination, only one product was manufactured, and volume ranged between 1700 and 8500 units per month. Adjustments were made in material cost because of specification changes and in labor cost because of across-the-board wage increases. No changes were made in the manufacturing overhead. In the sales and administrative expenses minor year-end adjustments were carried back to the proper months. The data required no adjustment for a time trend, for either a general price rise or increased efficiency.

From the eighteen monthly statements direct labor, material, factory overhead, total manufacturing cost, and sales and administrative expense were plotted on separate scatter diagrams with cost or expense being measured on the Y-axis and volume along the X-axis. As an example, the scatter diagram for total manufacturing cost is shown on Exhibit 3. After plotting the points, the line that most closely follows the trend of the data must be determined. It

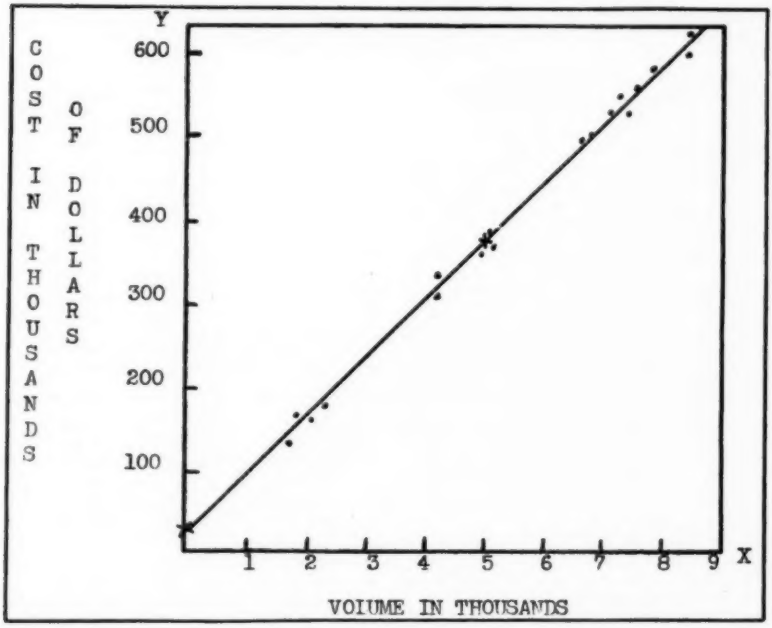


EXHIBIT 3

can be a straight line or a curve. In this instance it is evident that a straight line better fits the data. The line can be drawn freehand by inspection, so that approximately the same number of points reside on one side of the line as on the other. More exactly, the line can be determined from its equation derived from the least squares formulas, which can be found in any statistics textbook. The equation for total manufacturing cost is $Y = 21{,}898.32 + 70.6446\ X$. Two points will determine the line: when X is 0, Y is 21,898.32; and when X is 5000, Y is 375,121.32.

Because many items of cost, such as supervision, have both fixed and variable elements, their separation into these two categories is often difficult. Yet,

Statistical Data from the Accounting Records

Element of cost	Regression equation	Standard error of estimate	Coefficient of correlation
Direct labor	Y = 875.27 + 6.9734 X	$ 381.91	.9996
Material	Y = 12,215.48 + 57.3025 X	$6,623.48	.9983
Manufacturing overhead	Y = 8,807.57 + 6.3687 X	$1,000.40	.9967
Total manufacturing cost	Y = 21,898.32 + 70.6446 X	$3,783.22	.9996
Sales and administrative expense	Y = 7,891.90 + 19.5818 X	$2,917.87	.9974
Total cost	Y = 29,790.22 + 90.2264 X	-	-

Volume-Cost Relationship

Volume	Estimated manufacturing cost	Estimated sales and administrative expense	Estimated total cost	Estimated average cost	Estimated marginal cost
500	57,220	17,683	74,903	149.81	90.23
1,000	92,543	27,474	120,017	120.02	90.23
2,000	163,187	47,056	210,243	105.12	90.23
3,000	233,832	66,637	300,469	100.16	90.23
4,000	304,477	86,219	390,695	97.67	90.23
5,000	375,121	105,801	480,922	96.18	90.23
6,000	445,766	125,383	571,149	95.19	90.23
7,000	516,410	144,964	661,375	94.48	90.23
8,000	587,055	164,546	751,601	93.95	90.23
9,000	657,699	184,128	841,827	93.54	90.23

EXHIBIT 4

this separation is necessary to prepare an accurate break-even chart. The scatter diagram provides the most satisfactory method of division. The amount of fixed cost in the total manufacturing cost of the Reliance Company is $21,898.32, the point where the line meets the Y-axis, or the value of Y when X is 0. The coefficient of X, $70.64, represents the cost of manufacturing an additional unit, or marginal cost. The scatter diagrams for other elements of cost also show the straight line as the proper fit of the data. Variable costs are constant, not increasing. The equations for the other elements of cost appear in Exhibit 4. That the coefficient of correlation for all items of cost is higher than .99 indicates that the straight line represents a near perfect correlation between volume and cost. The volume-cost relationship was prepared by substituting the volumes in the first column for X in the designated equations.

In the break-even chart (Exhibit 5) prepared from the data in Exhibit 4, the break-even volume is 857 units per month, at which point total cost and revenue are $107,125. Fixed costs per month are $29,790.

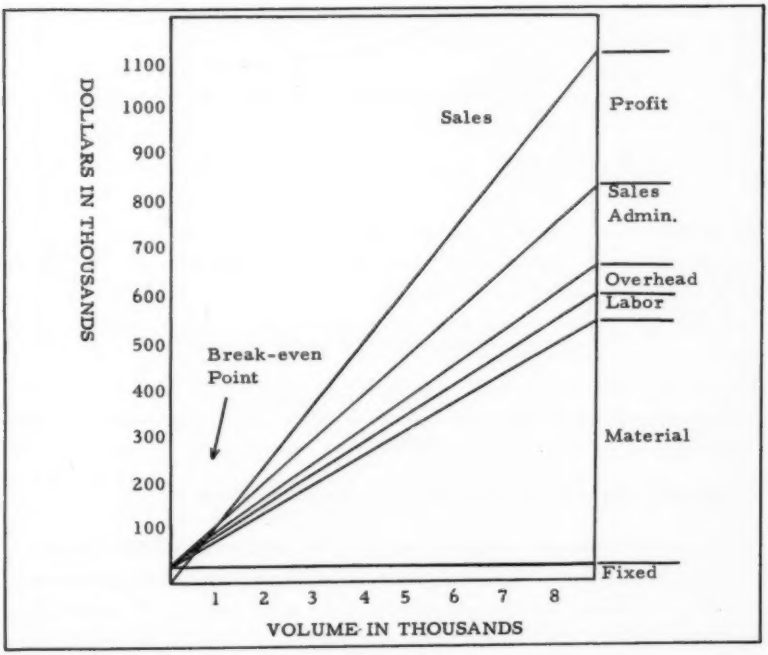


EXHIBIT 5

Variable costs for the Reliance Company are constant. Since this is so, the cost of producing each additional unit is the same; that is, marginal cost is also constant. From the marginal graph above it can be seen that unless marginal cost is rising, it cannot equal marginal revenue. In this instance marginal revenue and marginal cost are represented by parallel lines; since they do not meet, the marginal graph cannot tell us the volume that maximizes profit. The marginal graph appears as in Exhibit 6.

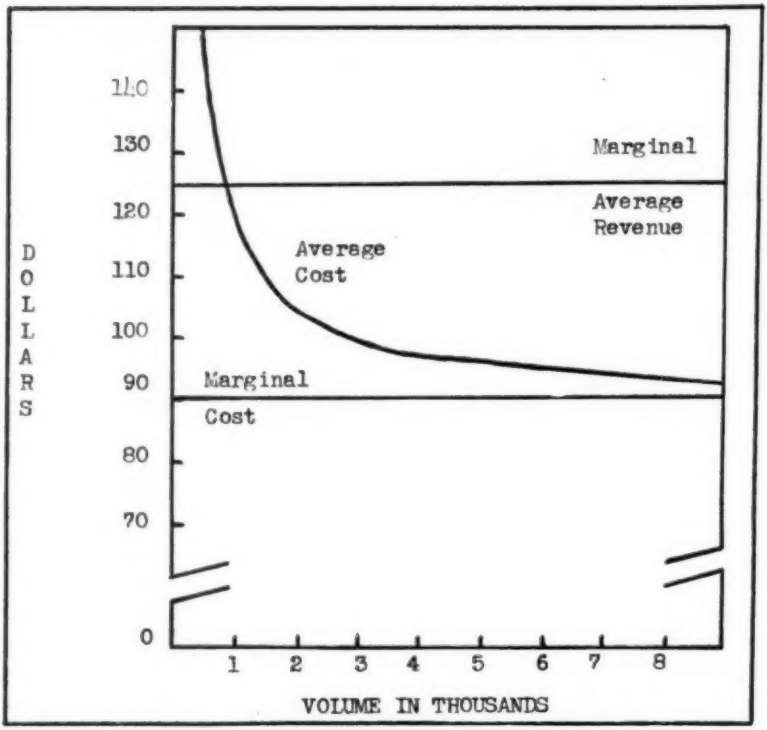


EXHIBIT 6

Fallacious Extension of the Law of Diminishing Returns

This fact of constant marginal cost is borne out in the accounting records examined by this writer over the years. Adjustments in accounting data must be made, of course, for changes in price level and efficiency, if a number of years are involved. Of the published cost studies seen by this writer the most comprehensive is the one presented by the United States Steel Corporation to

the Temporary National Economic Committee in Washington.[1] For the period 1927-1938 the total cost of U. S. Steel operations, adjusted to 1938 prices and efficiency, was related to tonnage shipped. The cost of each additional ton shipped, or marginal cost, was constant at $55.73. In this period production was as high as 90.4 percent and as low as 17.7 percent of rated ingot capacity. Variations ranged from a high of 15.1 million tons shipped in 1929 to a low of 4.4 million tons in 1932. By 1937 shipments had climbed to 13.2 million tons only to decline to 7.8 million tons in 1938. Despite the wide range and the abrupt shifts in volume, the cost of each additional ton shipped remained at $55.73. Fixed costs, adjusted to 1938 conditions, were $182,100,000 annually. Increased volume, therefore, would result in decreasing average cost per ton, as the $182,100,000 would be spread over a greater number of units.

Why is the marginal cost of a business firm, whether the firm is large or medium or small, constant? Why does not marginal cost rise? The concept of increasing marginal cost is as old as the science of economics itself. It rests on the famous law of diminishing returns, which can be stated as follows: If the methods of production are unchanged, and one factor is gradually increased, while the other factors remain fixed, the increase in output will for a time be at an increasing rate but a point will be reached after which the increase will be at a decreasing rate. The law is true, in fact, it is a truism when applied to agricultural production. At some point diminishing returns must set in, otherwise we could feed the world from a given plot of land merely by adding more and more units of capital and labor. The question is not whether it is true, but whether it is applicable.

Even in agriculture, improved methods have enabled us not to abolish the law but, so far, to escape its consequences. Manufacturing, however, presents an entirely different picture. Its factors are not fixed. Machinery, unlike land, can be reproduced. If a given amount of equipment cannot yield an ever-increasing output, it is not a relevant factor, as in the case of land, because society is not limited to that quantity of equipment. Moreover, in manufacturing a single factor is not added in a great number of small doses to other factors which are fixed. Technically it is not possible. Factors are added in combinations, in packages. In the operation of a machine designed for ten men, if men were added one at a time, conceivably production per operator would increase up to ten men and then decline. But, in fact, a package of one machine, ten men, and a definite quantity of material would be added at one time. In

[1] *United States Steel Corporation T.N.E.C. Papers*, Three Volumes, New York, 1940. See also two studies by Joel Dean in the October 1936 and July 1941 issues of *The Journal of Business* of the University of Chicago.

effect, the "best" combination of factors is predetermined, or locked in, and produces each unit at the same variable cost.

The marginal theory states that marginal cost increases, or diminishing returns set in, "after a certain point is reached." This "certain point" is not defined. Occasionally, however, there is the implication that marginal cost begins to rise at full capacity, as the result of activating obsolete equipment, employing less efficient labor on an overtime or three-shift basis. If so, this is the exception that does not prove but destroys the rule. How often is our economy at full or over-full capacity? This condition has prevailed only in wartime. In normal, peacetime operations firms do not operate at a rate exceeding capacity. Lack of coordination between demand and capacity for a firm's products would make operations even at full capacity difficult to achieve for any significant period. Moreover, the increase in production after full capacity is reached would be very small as compared to total production. Since this increase would be small, the proportion of more costly factors to total factors of production would also be small, too small to impair "the best proportion" to the degree necessary for marginal cost to rise.

The "predetermined" or "locked in" combination of factors that produces constant variable cost applies only to manufacturing costs. Sales and administrative expenses do not enjoy this relative immunity from human caprice. They are subject to management control and could take any direction. But the odds are against increasing cost. In this day of budgets, an alert management is quick to detect and eliminate the cause of any rising unit cost it can control. Once determined, sales and administrative expenses are largely fixed, so that increasing volume results in decreasing unit cost. Sales cost per unit is sometimes seen to rise as volume expands, because sales would become increasingly hard to get. But, on the other hand, declining sales can provoke larger expenditures on advertising and sales personnel. Whatever the inclination of these costs, there is nothing predestined about it.

In summary, the difference between the break-even chart and the marginal analysis is a very real one. Experience indicates that the relationship between cost and volume is best expressed the way the break-even chart expresses it, as a linear or straight-line function. Variable cost and marginal cost are constant, and the net result, when combined with the effect of the allocation of fixed cost over an increasing number of units, is decreasing average cost. Increasing marginal cost as depicted on the marginal graph is the result of the mistaken application of the law of diminishing returns to the manufacturing firm. The increasing marginal cost concept persists because the records of business enterprise are not generally available for study.

Orienting Controls to the Product Life Cycle

by ALLEN H. SEED

WHEN INCREASED costs and competitive pressures squeeze profit margins, an extra premium is placed on the quality of decisions to study, develop, introduce, improve or eliminate products. Because a company's products are its lifeblood, false steps in this high-stake process can have resounding and lasting effects. Sometimes these effects are disastrous, but more often, we have found, profit opportunities are wasted by the cost of adjustments, inventory write-offs, lost good-will and the like.

The kinds of decisions that we are concerned with here are those that deal with the life cycle of a product. The concept of a product life cycle is very much like that of a human being. To illustrate, a product usually passes through several phases—it is born, it grows, it matures and it dies. In our business these phases have been more specifically identified as follows:

Conceptual—new product ideas are analyzed and screened; specifications are determined to meet customer needs.

Developmental—prototype models are designed and tested; working drawings are prepared.

Introductory—a few units are produced and evaluated; marketing plans are prepared.

Growth—sales and profits increase as the product becomes accepted in the market.

Competitive—sales stabilize and margins are narrowed by competition; emphasis is placed on design improvements, cost reduction and market development.

Drop out—sales decline as old products are replaced by changing needs and new designs.

The timing of each phase varies and the identification of the point at which one phase ends and another begins is not always clear cut but, in spite of these fluctuations, we have found that the basic concept is sound, and this raises some important control considerations. Four questions lead to the root of the matter:

ALLEN H. SEED, Minneapolis Chapter (Twin City, 1947), is Controller of Motec Industries, Inc. (formerly Minneapolis-Moline Company). At the time that this manuscript was written he was associated with Daffin Corporation, Hopkins, Minnesota. Mr. Seed was graduated from Yale University with a B.S. degree. He is a previous contributor to the *Bulletin*.

1. When, during the product life cycle, are decisions required?
2. What sorts of decisions must be made?
3. Where do existing controls fall down?
4. What kind of a control structure is needed?

The answer to these questions, as they apply to the accounting practices of one medium-sized hard goods manufacturing firm, will be explored in the succeeding paragraphs.

Identifying Decision Points

A sound control structure must first point out when action is needed. Sometimes the need for action is elusive. For example, a single product among many, may slip unnoticed from the growth to competitive phase. Considerable ground may be lost for lack of design improvements, promotions in the market place or other action aimed at combatting competition. One of our steps, therefore, was to identify the mileposts of the product life cycle as they pertain to our business, and to specify the decisions which are made at each stage.

Product management decisions, it will be noted, involve almost every function of the business—engineering, marketing and manufacturing. Contrary to popular conception, then, decisions are not limited to the purely developmental phase of a new product but, rather, stretch over a relatively long span of time (typically 5 to 10 years) and require a wide range of managerial skills. This is not to minimize the importance of decisions made in the early stages. Indeed, probably the most significant decision that is made is the one to design a new product. And this is so because this decision is usually the beginning of a whole chain of subsequent commitments. However, the product management job is by no means finished after a product has been introduced to the market.

Common Denominators of Decision Making

After the points where product decisions should be made are identified, the next step is to determine the decisions that are required. We found that there are three common control denominators to each product decision irrespective of whether it concerns the size of a pilot run, new tooling, a change in selling price or other matter. They are: (1) evaluation of alternatives, (2) an authorization to take action and (3) a means of appraising results. Evaluation requires yardsticks so that decisions in each phase of a product life cycle can be based on the probable economics of the proposed undertaking. Authorization requires that a mechanism be provided for reviewing these economic considerations

and deciding upon a specific course of action. Appraisal requires that the actual impact of product decisions be measured so as to profit from past experience and so that performance (good or bad) may be recognized. This last requirement implies not only that expenditures be measured but that the results of these expenditures be measured as well.

Shortcomings of Functional Controls

A traditional structure of controls unfortunately does not always fulfill all the decision-making requirements of the product life cycle. For example, our company prepares budgets for each cost center and division, compares monthly results with the budget, and has for some time required authorizations for capital expenditures, engineering projects and product line additions and eliminations. But the plain truth of the matter is that, although we knew whether we were spending too much, we had no way of knowing whether we were getting the results from these expenditures that had been expected. In fact, in many instances we were not even sure what results to look for, because what was proposed had not been translated in terms of its impact on profit. These shortcomings are not uncommon.

Here is another limitation to consider: Management control is usually oriented toward functional management in order that individual performance may be measured and appraised. But each function is often concerned with several products and, as previously pointed out, product management cuts across functional responsibility lines. This means that single product performance can be easily buried in a functionally oriented report structure.

What about authorizations? Properly conceived authorization forms of various sorts can be useful as control tools when new products and expenditures are proposed or old products are eliminated. However, authorizations typically miss the long in-between stretch of the product life cycle, where the greatest profit opportunities often exist—the phases of growth and competition.

Our problem here, then, was to develop a structure oriented to product control and guidance of product decisions which would supplement our more traditional structure for functional control. As a solution to this problem, our company developed a program built around the elements of our existing control structure but which also embodied the three main requirements of product control: product evaluation, authorization and appraisal.

Evaluating Product Decisions

It is surprising how often businessmen are tempted to embark upon projects

involving substantial commitments in man-hours and dollars with little more than a sales forecast or perhaps only a notion that "there must be a market somewhere." This kind of decision is certainly not economically oriented! At the other extreme, there is a temptation to develop complex forms and techniques for economic evaluations (a good example are those for capital expenditures). Although these techniques may have much to offer from a point of view of technical excellence, in more than one instance they have fallen down because the "plant manager in Louisville," the "district manager in St. Louis" or the "superintendent in shipping" was unable to understand the arithmetic. This kind of approach is not the answer either.

In between the two preceding extremes, we found that it was helpful to provide a few relatively simple (although somewhat arbitrary) yardsticks which can be applied by the engineers, factory and marketing people who propose product decisions. In our case, these yardsticks include: (1) margin and capital turnover objectives, (2) costs as a percentage of selling price by product line, (3) manufacturing cost per unit of product for representative products, (4) direct manufacturing costs per hour, (5) inventory objectives in days, (6) production lot size and frequency objectives, (7) order point and quantity objectives for field warehouse stocks, (8) capital expenditures pay-out objectives and (9) development costs related to potential profit. Because the originator's proposal is accepted by management more often than it is rejected, the application of economic yardsticks is probably the most important aspect of our product control program.

Authorizing Action — PIP

Coupled with the importance of economic analysis by the originator of a product decision is the need to provide a mechanism for reviewing and authorizing proposed action. In our company, all the forms which were previously used to authorize product decisions (research and engineering projects, additions to the product line, capital expenditures and product eliminations) were reduced to one document called PIP (Profit Improvement Project, Exhibit 1). Although the PIP is used to authorize all capital expenditures and many other projects which are not part of product management, its primary function is to report the economics of, and authorize, the product decisions (Exhibit 2). PIP is generally required when the proposed decision involves over 40 manhours or an expenditure in excess of $200.

PIP's are usually prepared before the beginning of each year and are submitted with the budgets for the year. However, they may be originated at any

PROFIT IMPROVEMENT PROJECT

Proposal No.

Product identification:	Division:	Account:	Authorization No.

What and how much - (describe and itemize cost of proposed expenditure):

Max. Cost

$

$

Why - (submit reasons for expenditure):

Results expected - (be specific):

Originated by:	Date:	Assigned to:	Time required:

APPROVALS		ACTUAL COST			
Authorization	Date	Reference	Amount	Reference	Amount
Dept. Head					
Div. Mgr.					
Sec. & Treas.					
President					

EXHIBIT 1

time. Anyone in the company may originate a PIP in order to take advantage of any bona-fide profitable idea. Also, PIP's need not be confined to the originator's own sphere of operation. All PIP's, however, must be approved by the head of the department responsible for the proposed undertaking. Then, if he approves the PIP, the department head is responsible for assigning and scheduling the work, which may or may not be assigned to its originator.

An approved PIP is the department head's authority to schedule and undertake the work. No purchases or commitments are allowed until the PIP is approved. If disapproved, the PIP is returned to the originator with a memorandum explaining the reasons for disapproval. The originator, through his department head and general manager, has then the prerogative of taking the PIP and memorandum explaining the reasons for disapproval to the president, whose approval overrides any prior disapproval.

In the event that it appears that (1) the authorized maximum cost of a PIP will be exceeded or (2) the results shown will not be achieved or (3) the time schedule requires revision, a new PIP is prepared. This new PIP is routed with a copy of the old to all concerned for authorization.

The authorization part of the control structure functions effectively when each level of management insists upon profit-oriented economic documentation for each proposal. Failure to obtain this documentation can seriously hinder this process.

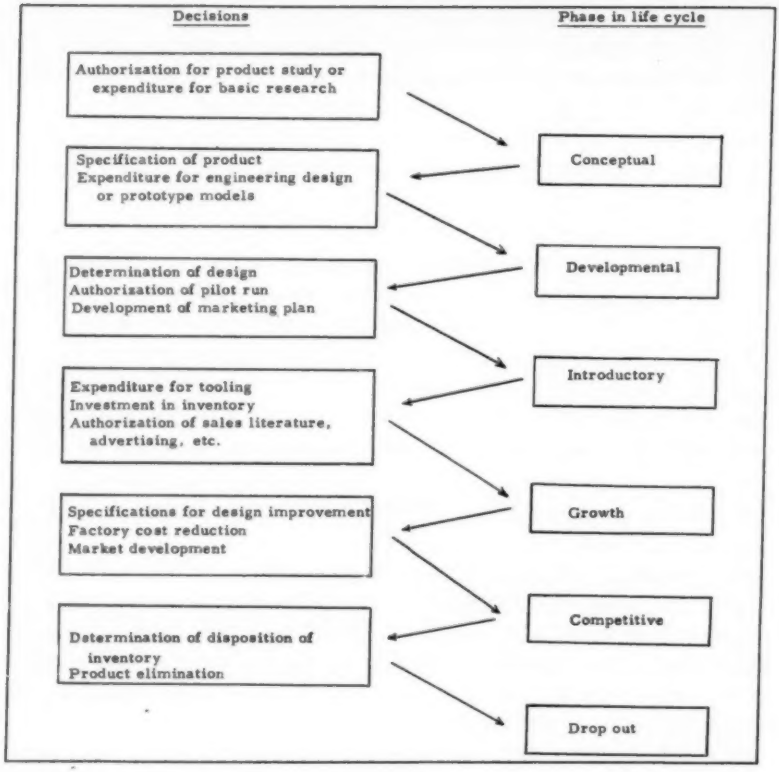


EXHIBIT 2

Appraising Results

Our accounting department assigns PIP authorization numbers. Requisitions for purchases and labor expended are identified with this number as well as with the basic account number. Charges are accumulated by PIP and account classification and summarized on a copy of the PIP form.

It is fundamental, of course, to keep in mind that controls do not provide a substitute for imagination and judgment, nor can business risks ever be eliminated. Yet the experience of many successful businesses has proved that a sound control structure and the use of meaningful yardsticks can provide an important guide for decision-making. This can do much to help capitalize on unrealized profit opportunities which are often unrecognized in the product life cycle.

The Need for Knowing Costs in Bank Trust Departments

by LEONARD L. RYNSKI

A GREAT VARIETY of services are offered by bank trust departments, such as investment, business management, estate planning, preparation of tax returns, etc. A fair amount of profit for such services must be earned by trust departments in order to contribute to the operating results of the banking institution which they represent, and to continue to provide competent as well as expanding services.

What is considered a fair profit might not be feasible under certain circumstances. For example, fees may be reduced below competitive amounts in an attempt to increase business or in an effort to promote and enhance certain types of services, or they may be held at reduced levels for certain accounts because the customer is an important depositor with the bank and every attempt is being made to keep such customers happy. However, as a basic principle, compensation received should be reasonable, in no case should it be less than the amount required to recover costs incurred in rendering the related service. Therefore, the first two questions which must be answered in a quest for fair profits are: What costs are incurred in the operation of a trust department? and, Do our present fee schedules permit a recoupment of all elements of costs so that the desired or intended profit margin is actually attained?

What Costs Are Incurred in a Trust Department

There are basically three categories of costs in the operation of a trust department. They are: (1) salaries and related salary costs, (2) direct expenses other than salaries, and (3) bank overhead. On Exhibit 1, the range of expenses is calculated summarily for 91 trust departments in different parts of the country. It is interesting to note the similar pattern of these costs regardless of location of the trust department or size in terms of total trust fees.

The compilation of trust department costs may appear, at first, to be a time-consuming and expensive procedure. This is not necessarily so. As a matter of fact, the simplest cost system is generally found to be the best. The objective is to obtain reasonable costs. The degree of accuracy desired should be considered carefully in advance to obtain satisfactorily correct results. To obtain

LEONARD L. RYNSKI, Detroit Chapter, 1957, C.P.A., is Manager, Arthur Andersen & Co., Detroit, Michigan. Mr. Rynski is a graduate of Michigan State University.

reasonable costs in most cases, it is not necessary to carry computations to their last decimal place. With these points clearly in mind, the following discussion describes a simplified method of accumulating costs applicable to a trust department of any size.

Salaries and Related Salary Costs

Salaries and related salary costs represent the most important element in the study of bank costs. In the summary of statistics on Exhibit 1, we find that salary costs in trust departments range from approximately 60 percent to 70 percent. This percentage, incidentally, is similar to salary costs applicable to the banking institution as a whole. In view of the significant ratio of salary

Range of Expenses in the Operation of Bank Trust Departments

	Range of Expenses*	
	From	To
Direct Expenses-		
Salaries and wages	56.7%	66.2%
Pensions and retirement	2.1	5.4
Personnel insurance	0.5	1.4
Other expenses related to salaries	0.8	1.2
Total expenses related to salaries	56.7%	69.7%
Occupancy of quarters	4.2%	8.7%
Furniture and equipment	1.9	3.2
Stationery, supplies and postage	1.7	3.8
Telephone and telegraph	0.8	1.1
Advertising	1.5	3.5
Directors' and trust committee fees	0.4	1.4
Legal and professional fees	0.4	1.2
Periodicals and investment services	0.4	1.8
Examinations	0.3	1.0
Other direct expenses	1.6	5.1
Total direct expenses	82.7%	90.0%
Overhead	10.0%	17.3%
Total Expenses	- %	- %
Summary-		
Salaries and related salary costs	56.7%	69.7%
Direct expenses other than salaries	17.1	28.4
Overhead	10.0	17.3
Total	- %	- %

* Range of expenses is slightly distorted since New England banks reported statistics in less detail than other districts and therefore are not entirely comparable with the other banks.

EXHIBIT 1

costs to total trust costs, it is important that they are honestly compiled and properly allocated to ensure the substantial accuracy of the cost analysis.

Salary costs of personnel directly related to trust department business should be accumulated by division of earnings and by type of activity. Exhibit 2 is a Trust Department Summary which may be used for the accumulation of salary costs. The purpose of developing costs by type of activity is explained below in the section dealing with the analysis of individual accounts. Some methods used in determining the basis for distribution of salaries are: time studies, volume of activity, daily diary of chargeable hours and estimate of percentage of time devoted to the various types of trust business.

Direct Expenses Other Than Salaries

Expenses directly chargeable to the trust department are taken from the various bank expense accounts. Ideally, costs for the entire bank should be analyzed and assigned to the various income-producing departments and further allocated to each earning division within a department. The determination of trust costs is then simply a further analysis of all expenses allocated to the trust department. However, it is not necessary to make a complete study of all bank costs to obtain trust department costs. It is necessary only to analyze total bank expenses for those directly related to trust activities and also in some cases to develop the amount of bank overhead to be allocated to the trust department.

In practice, some banks charge the majority of expenses attributable to the trust operation to one account, whereas in other cases these expenses may be charged to the various bank expense accounts. For example, advertising costs may all be accumulated in one account, making it necessary to review this account with the advertising manager to establish amounts chargeable to trust business. This may also be true of legal, professional and other fees. After all direct expenses have been determined, they too should be summarized on a trust department summary (Exhibit 2) by type of activity and by division of earnings. It will be found, in connection with some of these direct expenses, that they are not directly assignable to a specific activity or to a particular division of earnings. For instance, this is generally true of supplies expense and telephone expense. One of the following two easily understood methods may be used for allocating such expenses:

1. On the basis of direct labor dollars.
2. On the basis of volume-of-activities count.

The method selected, of course, should be the one which will give the most reasonable results.

EXHIBIT 2

Trust Department Summary

Employee name: _____
Bank department and job classification: _____
Percent of time:
Devoted to trust department activities %
Devoted to other banking departments %
100%

	Allocation of Costs by Division of Earnings					
	Estates	Personal trusts and agencies	Profit sharing and pension trusts	Corporate agency	Unallocated	Total
Mortgages						
Acquisition						
Liquidation - close out payments						
Maintenance						
Real estate						
Properties received						
Properties disposed of						
Rent payments received						
Maintenance - repairs, inspection, arranging rentals, general supervision, etc.						
Collection of Income						
Coupon interest						
Dividends						
Miscellaneous income items						
Remittances						
Periodic remittances of income and principal						
Discretionary remittances of income and principal						
Pension trust disbursements						
Profit sharing - deferred compensation, etc.						
Miscellaneous - payment of bills, taxes, etc.						

Bank Overhead

Bank overhead consists of the expenses in connection with the general administration of the banking institution, the personnel department, the auditing department, the mailing department, vault usage and other service departments. Overhead allocated to the trust department normally does not include any portion of the expenses of other income-producing bank departments unless they service the trust department.

In the case of large banks, overhead expense is generated from service departments which are significant in the scope of their activities and, therefore, it is necessary to develop allocations by making detailed analyses for accurate results. However, in the case of smaller banks, it is possible to eliminate the detailed analysis and distribution of all the bank's expenses to determine the actual amount of overhead and, instead, to adopt an arbitrary overhead factor. For example, the statistics on Exhibit 1 show a range of 10 percent to 17 percent for overhead expenses applicable to banks of various sizes and in various parts of the country. It is possible that overhead expenses may be reasonably accurate if set at a percentage somewhere in between this range, say, 13 percent. Such a percentage, if adopted, may be used to represent the overhead factor in determining total expenses in the operation of a trust department.

In summary, the costs which are incurred in a trust department and the methods by which they may be easily developed, particularly in smaller banks, are as follows:

1. Salaries and related salary costs—largest element of cost, representing as much as 70 percent of total trust department costs—must be accurately accumulated and allocated to trust activity. Distribution of salary costs may be based upon estimates of percentage of time devoted to the various trust activities.
2. Direct expenses other than salaries are determined by an analysis of bank expenses for those directly related to trust activities.
3. Bank overhead may be assigned by the use of an arbitrary percentage.

Adequacy of Trust Department Fees

Having determined total trust department expenses covering a period of time, preferably one year, trust department fees earned over the same period of time should be accumulated and a department income and expense statement prepared. A Trust Department Statement of Income and Expenses is

TRUST DEPARTMENT STATEMENT OF INCOME AND EXPENSES

	Amount	Per Cent
GROSS INCOME	$ 120,100	100.0%
DIRECT EXPENSES:		
Salaries	$ 66,200	54.4%
Pension and profit-sharing costs	11,300	9.4
Occupancy of quarters	8,200	6.8
Advertising	2,500	2.2
Stationery, printing and office supplies	2,400	2.1
Professional fees	1,100	1.0
Postage	2,100	1.8
Telephone	1,800	1.6
Depreciation - furniture and fixtures	1,000	0.9
Employee payroll taxes	900	0.8
Travel	800	0.7
Insurance	600	0.5
Education and training	600	0.5
Examinations	600	0.5
Directors' fees	200	0.2
Miscellaneous	1,300	1.2
OVERHEAD EXPENSES (allocation of expenses from departments performing services for the trust department)	13,700	11.4
Total expenses	$ 115,300	96.0%
Net operating income (loss)	$ 4,800	4.0%
Average cash balance	$1,000,000	

EXHIBIT 3

illustrated on Exhibit 3. The objective of this statement is to establish whether the trust department operates at a profit or at a loss. Extraordinary items should be isolated when analyzing income and expense accounts so that normal operating results are determined.

The statement of income and expenses is important to bank management as well as trust officers. Bank management should expect the trust department to operate profitably and contribute to total bank earnings just as all other income-producing departments do. It is true that some trust accounts may represent important depositors in the bank and there might be an inclination to promote such accounts by charging only minimum trust fees. It is also true that some accounts must be accepted at minimum fees. Therefore, from the standpoint of proper management of the trust department, it is imperative that trust costs be known and that fees be established on a sound basis. In summary, avoid across-the-board inadequate fees by installation of rate structures based upon costs of doing business in addition to providing a margin of profit. This method of operation will permit the trust department to show profits and not reduce the over-all earnings of the bank. In those cases where it is necessary to

offer services at reduced rates, bank management can be informed of this action for proper recognition.

Earnings by Divisions of the Trust Department

The trust department statement of income and expenses is important to both trust officers and the management of the banking institution, since it reports the over-all operating results of the trust department, but still more important to trust officers is a statement showing earnings by type of business. Such a statement, illustrated on Exhibit 4, shows by class of accounts or business the gross income received matched with applicable expenses and the resulting net income or loss. Four classes of earnings are illustrated—estates, personal trusts and agencies, pension and profit-sharing trusts and corporate agencies. This classification of earnings may be further expanded; however, it is convenient to group classes of accounts having similar characteristics and activities, since they will probably have similar costs and similar fees. A statement of earnings by type of trust business is a very effective tool in the trust department and provides information such as:

1. Profitable and unprofitable divisions.
2. Margin of profit earned by class of business.
3. Excessive expenses.
4. Inadequate fees.
5. Concentration of business.
6. Trends over a period of time.

The data necessary to prepare a statement of operating results by division is developed in connection with the preparation of the trust department statement of income and expenses. Therefore, it is necessary only to match the expense developed on trust department summaries to the gross income received by each division.

Reviewing the results on Exhibit 4, interesting observations may be made:

1. Considering all functions, the trust department net operating results showed a small net profit which actually can be considered as an approximate break-even. However, the deposits provided to the bank approach an average of $1,000,000, from which the bank derives net earnings. These earnings have not been reflected in these results but apply to the trust department.
2. Concentration of business is in personal trusts and agencies, and it is significant that this division is incurring substantial losses. It is obvious that the present fee structure is not adequate to cover costs. This situation will occur if fees are designed for trusts hav-

EXHIBIT 4

Statement of Operating Results by Type of Trust Business

Income and Expense by Type of Activity	Estates	Personal Trusts and Agencies	Pension and Profit-Sharing Trusts	Corporate Agencies	Total	
					Amount	Per Cent
GROSS INCOME	$ 37,000	$ 57,200	$ 20,400	$ 5,500	$ 120,100	100.0%
EXPENSES:						
General and administration-						
Opening accounts	$ 5,400	$ 5,100	$ 1,100	$ -	$ 11,600	9.3%
Closing accounts	2,800	2,000	100	-	4,900	4.2
Account maintenance	2,700	15,700	2,000	400	20,800	17.1
Stock and bond transactions-						
Purchases	-	1,400	900	-	2,300	2.0
Sales	-	400	100	-	500	0.4
Receipts and deliveries	-	1,000	600	-	1,600	1.4
Investment reviews, analysis, etc.	100	11,900	4,500	-	16,500	13.7
Mortgages	100	1,800	-	-	1,900	1.6
Real estate	1,200	4,100	-	-	5,300	4.4
Collection of income	-	2,700	700	-	3,400	2.9
Remittances	200	4,800	3,900	100	9,000	7.5
Bookkeeping	200	4,500	800	900	6,400	5.3
Rendering of accountings	700	7,700	600	-	9,000	7.5
Tax returns	800	3,500	-	-	4,300	3.7
Registrar duties	-	-	-	800	800	0.7
Transfer agent duties	-	-	-	3,200	3,200	2.8
Bond paying agent duties	-	-	-	100	100	0.1
Dividend paying agent duties	-	-	-	500	500	0.4
Business development	600	8,400	4,100	100	13,200	11.0
Total expenses	$ 14,800	$ 75,000	$ 19,400	$ 6,100	$ 115,300	96.0%
Net income (loss)	$ 22,200	$(17,800)	$ 1,000	$ (600)	$ 4,800	4.0%
Average cash balance	$100,000	$530,000	$350,000	$20,000	$1,000,000	

ing larger amounts of total assets and the trust department, over the years, has changed in composition and carries a majority of smaller accounts. There are fixed costs which are incurred irrespective of trust size. Additional small trusts provide only minor amounts in deposits to the bank, so an alternate form of compensation to the bank is not derived from this source.

To obtain a satisfactory solution to this problem it is necessary for the bank to look at two things. First, the costs of rendering this service should be reviewed to determine if they are reasonable or whether costs can be reduced. Second, if it is found that costs are reasonable and cannot be reduced significantly, then a revision to the fee schedule may be necessary. However, before any revision to the fee schedule is made, it is important to know the relationship of fixed costs and variable costs to total costs incurred. A significant portion of total costs may be relatively fixed. This would mean that a substantial additional amount of fees could be received from new business, without incurring any proportionate amount of increased costs, in which event the fee structure may be quite proper.

3. Pension and profit-sharing trusts show only a small profit; however, there are factors which indicate that they will not remain unprofitable. Annual contributions will cause these accounts to have increasing balances. In addition, as these trusts grow, it could reasonably be expected that cash deposit balances with the bank would increase, providing an alternate type of earnings to the bank.
4. Estate business has been the most profitable for the department.
5. Corporate agencies are a small part of the trust department business. If there is any intention to promote this business, a further analysis of costs incurred must be made to determine whether these costs are reasonable. If costs cannot be reduced significantly, a revision of the rate structure may be necessary in order to operate on a profitable basis.

The preparation of a statement of operating results by division of earnings and an analysis of the results determined can be the stepping stone in setting adequate fees. However, while this information is of value to bank management in showing the profitability of each type of trust business, it will not reveal the profitability or unprofitability of individual accounts. Therefore, it is necessary to further analyze the expense of each operating division to establish suitable cost factors upon which to measure the cost of services rendered and upon which to base adequate fees.

Analyzing and Costing Individual Accounts

The methods used to place reasonably accurate costs on services rendered

EXHIBIT 5

ILLUSTRATION OF PAGE OF DAILY DIARY AND PREPARATION OF BILLING SHEET

Sample Page of Daily Diary of Trust Officer

Monday, October 6, 1958

2 hours	-	Account 1029
1 hour	-	Account 998 Investment reviews
1 hour	-	Account 419 Review of tax return
1 hour	-	Account 802 Court appearance - accounting
2 hours	-	Promotion (visit to NYE Mfg. Co. re: profit sharing plan)
1 hour	-	Office administration
8 hours		

To →

Hours posted at selected intervals to account cost sheet showing pertinent information required for future analysis and billing of individual account.

To →

Preparation of Billing Sheet

Hours	Name	Rate	Amount
	Trust officers-		
10	J. Brown	$14.20	$142.00
8	H. Adams	8.60	68.80
	Clerical-		
25	M. Smith	2.90	72.50
	Total costs		$283.30
	Add: Margin of profit		
	Total fee		$
	Out-of-pocket expense		25.00
	Total fee and expense		$

Rates may be predetermined using relationship of costs (assuming salaries 70%, direct expenses 17% and overhead 13%) as follows:

	Salary Cost/Hour	Salary Adjusted*	Add Other Expenses (30%)	Rate
J. Brown	$8	$10	$4.20	$14.20
H. Adams	5	6	2.60	8.60
M. Smith	1	2	.90	2.90

*Represents adjustment for time not charged directly to accounts, such as promotion, administration, etc. however such time should be recouped in fees.

in a small trust department do not have to be as precise as those used in medium and large trust departments. For example, in a trust department having only one trust officer and one or two other employees, charges to accounts could be developed on the basis of time accumulated in daily diaries. All expenses can be assumed to follow salary costs. Therefore, to determine total costs applicable to individual accounts, it is necessary only to summarize hours by accounts as recorded in the diaries. Multiply the hours by the applicable predetermined labor rates to arrive at direct salary cost. To arrive at a proper charge per hour, amounts for trust department direct costs, bank overhead and a margin of profit should be added to the salary costs. The amounts to be added to salary costs may be determined by referring to the relationship of costs on the trust department statement of income and expenses. Exhibit 5 illustrates the manner in which time is recorded in the daily diary and how it may be reported to bookkeeping for posting to a cost sheet set up for each trust account. Exhibit 5 also illustrates the manner in which time costs are accumulated for billing to a trust account for services rendered over a designated period.

In medium and large trust departments, considered to be those having total assets in excess of $10,000,000, duties are generally well defined and segregated and therefore it is feasible to develop unit costs for the various routine activities. Cost for services other than routine activities should be accumulated based upon time recorded in daily diaries. The Trust Department Summary (Exhibit 2) was used to gather the elements of costs by type of activity in the trust department. Therefore, to develop unit costs, it is necessary only to divide the units of activity into the total costs which represent salary costs, direct expenses and overhead. If units of activities are not regularly developed in the trust department, they may be accumulated over a representative period and annualized to determine total estimated units for the year.

Using the foregoing bases, a proper unit charge for each type of activity and service to be offered should then be predetermined. By the use of such predetermined rates, an analysis of a customer's account can be obtained as illustrated on Exhibit 6.

Use of Daily Diary

The procedure suggested to record time in a daily diary and charge accounts for services rendered based upon accumulated hours is not new, and is actually commonly used by service-type organizations such as legal and public accounting firms. It is equally suited to trust department operations, in view of the variety of services offered such as investment, estate planning, tax returns, etc.

ANALYSIS OF INDIVIDUAL ACCOUNT USING PREDETERMINED RATES

JOHN SMITH - TRUST UNDER WILL

ANALYSIS FOR THE YEAR ENDED DECEMBER 31, 1958

	Items	Rate	Amount
Cost of Services Rendered-			
Routine activities-			
Account maintenance	12 (mos.)	$4.00	$ 48.00
Bookkeeping (postings)	100	.12	12.00
Remittances (checks)	20	1.00	20.00
Collections	25	.25	6.25
	Hours		
Other activities-			
Investment reviews	10	9.00	90.00
Real estate supervision	20	8.00	160.00
Tax returns	15	9.00	135.00
Total costs			$471.25
Margin of Profit			
Fee			$

EXHIBIT 6

Furthermore, it will assure that charges are made for these various special services and, in addition, will accumulate costs for extraordinary time spent and services rendered on certain accounts. Accumulating time charges by account in addition to charges for routine activities provides an excellent basis upon which to determine adequate fees.

Some persons may feel that maintaining daily diaries and accumulating time by account and by type of service will result in a loss of efficiency. This is not true. Service organizations using this basis have found it easy to apply and the best basis upon which to charge their fees. In addition, there are other advantages of accumulating chargeable hours. Amounts of productive hours

by trust officer and by the entire department can be determined in conjunction with total hours devoted to promotion activities, total hours devoted to administrative duties and total idle hours. Decisions may be made, after analyzing these hours, to devote more or maybe less time to promotion, or that idle time must be eliminated in one way or another. Trust officers will be more conscious of how they use their time in performing duties for which they are responsible and will find it expedient to delegate minor tasks to clerical personnel so as not to charge excessive fees on their accounts.

A word of caution in connection with accumulating hours might be in order here. Each trust officer and employee should be required to account for all hours in a working day. For example, if eight hours represent a working day, then eight hours should be accounted for and detailed between productive time (special services by account or routine activities) and nonproductive time (promotion, idle time, holiday, vacation, etc.) Time reported in this manner must be in agreement with pay-roll records to assure the accuracy of time charges distributed to trust business.

Conclusions

In concluding, a fair margin of profit on trust business is attainable only if fees are determined on a sound basis. The cost of doing business must be the basis upon which fees are determined. The elements of cost applicable to the operation of a trust department are: salary costs, direct expenses other than salaries, and bank overhead. To these costs the desired margin of profit should be added in arriving at fees.

Fees should be computed for individual trust accounts on the basis of chargeable hours to the extent possible. This can be efficiently accomplished by requiring that each trust officer and employee maintain a daily diary to record chargeable and nonchargeable time. This procedure provides for the automatic accumulation of charges for services rendered and particularly for special and extraordinary services to permit a proper determination of the fee applicable to individual accounts.

Does the Accounting Profession Extend Beyond the Practice of Public Accounting?

by PATRICK S. KEMP*

IN A RECENT ARTICLE in the *N.A.A. Bulletin*, Professor Robert E. Schlosser discusses the feasibility of awarding to the qualified private accountant a certificate comparable to the C.P.A. certificate — Certified Industrial Accountant.[1] I have long agreed with his view that nonpublic accountants should have such a designation, but I feel that the problem extends beyond merely awarding a new certificate. I should like to explore here some other aspects of the rightful place of the nonpublic accountant as a member of the accounting profession.

Perhaps the most important problem lies in defining the boundaries of the accounting profession. There seems to be a prevailing attitude in the minds of many practicing public accountants, as well as accounting educators, that the accounting profession is limited not merely to holders of the C.P.A. certificate, but, even more stringently, to practicing public accountants. This view excludes, of course, those C.P.A.s who work in private industry, government, etc. As Professor Schlosser points out, "There is little, however, to substantiate a claim that the independent C.P.A. be considered the only professional accountant."[2] If this claim is correct, where does the controller of a private corporation or the supervisor of a governmental accounting unit fit into the professional accounting picture? Are they to be excluded entirely, regardless of whether or not they are C.P.A.s, simply because they are not practicing public accountants?

What are the characteristics of a profession? Apparently, one such characteristic in the minds of those who would limit the accounting profession to practicing C.P.A.s is independence. They do not follow this criterion consistently in their definition of the profession, however, for they presumably include as professional accountants all the non-partner C.P.A.s in public accounting firms. Yet these men are not independent practitioners, but employees of a firm, just as the controller of a private corporation is an employee. They are presumed to maintain an independent attitude in conducting an audit, but this attitude alone does not render them independent practitioners. There is no essential

* Assistant Professor of Business Administration at Emory University, Atlanta, Georgia.

[1] "Professional Standing for the Nonpublic Accountants?", Robert E. Schlosser, *N.A.A. Bulletin*, September 1960.

[2] *Ibid.*

difference in so far as independence is concerned between an employee of a public accounting firm and an employee of any other type of company. Further, let us note that the physician or attorney on the staff of an industrial concern is usually considered no less a member of his profession than his fellow who is engaged in private practice. Thus, it appears that independence (in the sense of practicing independently) is not a valid criterion for determining membership in a profession.

Another possible criterion for determining professional status is a suitable educational background for performing the work involved in the particular profession. As we well know, educational background has long been accepted as a necessary characteristic of many professions. The medical and legal professions have formalized this requirement to the extent of establishing separate professional schools from which the prospective members of their professions must graduate in order to be eligible to enter the profession. Although the accounting profession has not yet gone so far as to establish separate professional schools,[3] an adequate educational background is rather generally recognized as a desirable attribute of the prospective professional accountant. Most public accounting firms, as well as most industrial and governmental organizations, now recruit their new accounting personnel almost exclusively from the ranks of recent college graduates. Furthermore, many state public accountancy laws, although they do allow the noncollege graduate to sit for the C.P.A. examination, contain provisions which make it much easier for the college graduate to attain the C.P.A. certificate.

The biggest difference in this regard between the accounting profession and those of law and medicine is the fact that accounting has no recognized university degree to correspond with the L.L.B. and M.D. degrees. Thus, although educational background certainly seems to be a desirable criterion for determining the accountant's professional status, the big problem now is determining just what constitutes an adequate educational background.

A third possible criterion is supervised experience. The importance of this factor as a prerequisite for entering a profession is exemplified by the internship and residency requirements of the medical profession and by the experience requirements in state public accountancy statutes. In the realm of public accounting, these requirements are clearly designated by statute, but so far nothing has been done to establish such requirements for the nonpublic accountant. As Professor Schlosser points out, however, this

[3] Some universities, however, have established professional accounting programs leading to such degrees as Master in Professional Accounting.

certainly can be done, even though it might be rather difficult.[4] Undoubtedly, properly supervised experience is a desirable criterion in determining professional status.

The final ingredient in the formula is surely a professional examination leading to the awarding of a certificate designating professional competence. The legal profession has its bar examination, the medical profession has its state board examinations and, so far at least, the accounting profession has its C.P.A. examination, all resulting in admittance to the respective professions. The obvious difficulty lies in the fact that, although the accounting profession encompasses a wide variety of activities, it has only one examination and one certificate of professional competence to cover all of these widely varying areas. Consequently, in order for the nonpublic accountant to acquire a badge of excellence in his chosen field, he must fulfill the preparatory requirements for and take an examination designed to test his competence to practice public accounting and thus to receive a certificate which denotes to the public his ability to do something which he is not doing. And this unfortunate situation exists not merely because there is no comparable certificate for the industrial or governmental accountant; the lack of such a certificate points clearly to the denial by one segment of the accounting profession of the professional status of another segment. Undoubtedly, the profession should develop an examination and a resulting certificate for the nonpublic accountant, such as Professor Schlosser suggests.

In summary, the essential characteristics of the professional accountant, whether in public accounting, private industry or government, are (1) adequate educational background, (2) properly supervised experience and (3) adequate performance on an examination designed to test his competence to perform his professional duties. Further, attainment of these three objectives should result in his receiving a certificate designating his professional competence. Our problem at present is that these criteria are recognized only for the public accounting portion of the profession.

[4] *Loc. cit.*

Flexible Costs for Pricing Decisions

by MORTON BACKER

PRODUCT PRICING is perhaps the most difficult decision-making area in which to formulate general principles. Pricing is influenced by a multitude of factors, including market conditions, the nature of competition, financial liquidity of the firm, inventory accumulations, existing capacity, product line investments, governmental pressures and cost recovery. It is not surprising therefore that most executives have difficulty in describing their firm's pricing policies except in such vague terms as long-run profit maximization. Indeed, it may even be unrealistic for business to attempt to establish and adhere to rigid pricing policies under such changing conditions. Instead, the prices of product should be constantly scrutinized and modified in accordance with existing circumstances. Admittedly the cost accountant's role in pricing decisions would be simplified if he could function within the confines of a clearly defined policy. What should his responsibility be, however, in the absence of a consistent pricing policy? Clearly, it is to provide cost data that is sufficiently flexible to be useful under varying economic conditions. It is toward this objective that our efforts will be directed.

Type of Costs Required in Pricing Decisions

There is a tendency either to underrate or overrate the importance of costs in pricing. The statements frequently heard that "prices are based on competition" or "prices are based on costs" are equally untrue. Both costs and competition are important in pricing strategy. In many situations, costs may have little direct impact on pricing. In joint cost industries prices, in fact, tend to establish costs rather than the reverse. However, rarely can costs be entirely ignored. Even where the influence of costs in pricing is not immediate, they generally have a strong supporting role in related decisions, such as whether to introduce a new product, which items to push, establishment of price differentials, etc.

DR. MORTON BACKER is Associate Professor of Accounting at New York University. He taught formerly at West Virginia University and was Dean and Professor of Controls at the Institute Direzionale e' Tecnico in Italy and Consultant to officials in the Italian Government. Dr. Backer authored *"The Handbook of Modern Accounting Theory,"* Prentice-Hall, Inc., 1955, and a number of articles. He will co-author a new book, *"Managerial Cost Accounting,"* which is scheduled for publication in 1961 by McGraw-Hill, New York. Dr. Backer received his B.S. degree from Boston University and his M.L. and Ph.D. degrees from the University of Pittsburgh.

To the extent that costs may be used in pricing, what kind of costs is required? Unmodified accounting costs will not suffice. In decision-making, costs must be purposive, they must be selected with a view toward solving the specific problem under consideration. Thus, in general, pricing requires certain modifications of accounting costs. In particular, pricing requires special uses of these modified costs, dependent on the situations.

All decisions are concerned with the future. Therefore, costs for decision-making purposes must be prospective rather than retrospective. Perhaps the greatest challenge to the accounting profession today is to develop improved methods for dealing with the uncertainty of tomorrow. Prediction of course involves risk which the accountant must be willing to assume. Otherwise, the interpretation of quantitative data will be assigned to others and the accountant's potentialities will not be realized. It should be recognized that forecasting requires a knowledge of economics, statistical sampling, correlation analysis, matrix algebra and computer "know-how" that few accountants presently possess. These broad gaps in accounting education will have to be overcome in the not too distant future.

Some evidence appears to exist that pricing executives are not oblivious to future cost trends. In connection with research on pricing procedures in which the writer was engaged, officers and other executives of twenty-five of our largest national firms were consulted. One question asked was "to the extent that costs are used as a basis for pricing, does your company use past or future costs?" Executives of twenty of the twenty-five firms indicated that their company's costs were being modified for significant future trends. However, in virtually every case where cost predictions were being employed, the procedure was informal and largely dependent on the knowledge and judgment of the executive responsible for pricing. In only one company did a formal procedure exist. This concern established prices by means of a top-level committee in which different functional executives participated. It was the responsibility of these officials to present data regarding the probability of cost changes in their respective areas, as for example, raw materials, personnel, advertising, etc. In such a setting, the role of the cost accountant can be important. He should be ready to assist these executives in developing the proper tools for planning and in checking the reliability of their estimates. Above all, he must be prepared to trace the effect of these cost trends on the company's revenue-cost-profit relationship.

One of the most glaring deficiencies in the use of costs for pricing is the inclusion of depreciation based on the acquisition cost of the assets in use. Apart from the merit or lack of merit of the financial accountant's adherence

to original cost for purposes of income determination, it is evident that in a continuing business product prices provide the funds not only for income distributions and growth but also for the replacement of existing assets at their market cost. Interestingly, in the study previously referred to, only two out of twenty-five concerns included price-adjusted depreciation in their product costs used for pricing purposes. Some executives whose companies did not adjust the depreciation cost stated that it was not a major cost element in their industry. However, most of the others professed concern about this procedure but claimed a lack of confidence in price-index statistics or a hesitancy to use costs differently for pricing and reporting purposes.

The accountant also fails to give formal recognition to imputed or theoretical interest. Yet, there is nothing theoretical about imputed interest on invested capital in certain pricing decisions. Indeed, in heavily mechanized and product-diversified factories, cost data not related to return on invested capital may prove entirely misleading to pricing executives.

The uncritical use of existing overhead rates also may be dangerous. Admittedly, the use of overhead rates under full costing tends to assure the recovery of total costs in long-run pricing. However, overhead rates fail to delineate with sufficient clarity those costs which are directly applicable to specific products or product lines. Even worse, they generally do not segregate fixed and variable costs, which is significant in certain types of pricing decisions.

Elasticity of Demand and Pricing

Every business is confronted by a demand schedule for its products. The degrees of elasticity of demand, or the extent to which the quantities demanded will react to price changes must be considered in the pricing scheme since it directly affects the product price-cost-profit relationship. Unfortunately, elasticity of demand cannot be easily measured. It does not have a fixed rate of change between different price levels. It does not remain constant in time. It is not even the same for different geographical regions. Despite these difficulties, pricing executives either should possess at least a general knowledge of the elasticity of demand for their products or consider the use of controlled experiments to gauge this elasticity. Fruitful results sometimes are encountered as a consequence of controlled price experimentation. For example, one large food concern discovered to its surprise that within a certain price-range there was a relatively inelastic demand for its product and thus was able to modify its price with a resultant increase in profits.

The nature of a product's demand elasticity may be indicative of the im-

portance of costs as an instrument in pricing. Where demand is relatively inflexible, volume is less affected by price changes and a company is afforded a greater opportunity to pass cost increases on to its customers. In noncompetitive price markets (e.g. monopolistic or oligopolistic, characterized by price leadership), where inelasticity of demand exists, the cost accountant should be prepared to show the effect of cost fluctuations on profits and the desirability of compensating price changes. This of course must be done in the cases of public utilities or other rate-regulated companies. If, on the other hand, demand is highly elastic in such noncompetitive price situations, costs should be used to show the profitability of products at alternative operating levels, dependent on the price-quantity possibilities that exist.

In highly competitive situations, regardless of the elasticity of demand in the industry as a whole, the individual firm is automatically confronted with an elastic demand schedule. A reduction in prices will attract competitors' customers and an increase in prices will have a reverse effect. In such industries, the pricing freedom of the individual firm is limited and costs exercise a less direct influence on pricing. Under these circumstances, costs are more important in decisions as to whether it is profitable to manufacture or not to manufacture certain products and in revealing which items are more profitable and should be "pushed."

Cost-Pricing Methods; Full-Cost Method

Although many "rule-of-thumb" procedures are utilized by pricing executives, we shall consider only the three most refined methods, namely, return on sales under full costing, return on investment under full costing, and marginal costing. We shall then attempt to combine the salient features of each method so as to provide a flexible cost basis for pricing, one that perhaps will serve more adequately under varying economic conditions.

Selling prices which are computed under the full-cost method involve the determination of individual product costs plus an addition for a desired profit margin. Companies using this method generally strive for a "fair return" which is expressed as a percentage of the selling price or cost to make and sell. A simplified example of the full-cost method appears below:

FULL-COSTING METHOD
(RETURN ON SALES)

	Product X	*Product Y*
Raw materials (quantities required × net purchase price)	$ 8.00	$ 3.00

Direct labor (hours required × hourly rate)	3.00	6.00
Factory overhead (200% of direct labor)	6.00	12.00
Cost to make	$17.00	$21.00
Selling and administrative (20% of cost to make)	3.40	4.20
Cost to make and sell	$20.40	$25.20
Profit margin before taxes (30% of cost to make and sell)	6.12	7.56
Proposed selling price	$26.52	$32.76

World War II created an impetus toward the use of full costing as a basis for pricing. During the war we not only had governmental cost-plus-fixed-fee contracts but also price control which sanctioned price increases according to prescribed cost formulas. Throughout the war and during the immediate post-war period an unprecedented demand existed for consumer products which permitted managements to accord greater consideration to costs in pricing their products.

The obvious advantage to be derived from the use of the full-cost method is that it assures total cost recovery. This is particularly important in long-run pricing. Despite its popularity, there are definite limitations to the full-cost method as a basis for pricing.

First, it ignores demand. Admittedly, the elasticity of demand can not be calculated precisely in practice, but a pricing system which is entirely dependent on "adding-up" costs can hardly be realistic. It is probable, therefore, that the majority of companies that profess to use the full-cost method actually make some allowance in their pricing calculations for the demand elasticity of their products.

Second, it fails to give consideration to competition. A business cannot operate in a vacuum, it should not assume that its functions are necessarily being performed at maximum efficiency. To do so would result in perpetuating existing inefficiencies and incorporating them into the price structure. Instead, a firm should constantly strive to reduce its costs so that they will be equal to or lower than than those of the most efficient competitor.

Third, the full-cost method does not distinguish between variable and fixed costs. A firm clinging to this method would be inclined to reject orders which do not at least cover the total product costs. Under certain conditions, however, the acceptance of such orders, providing they cover at least the "out-of-pocket" costs, will result in increased profits.

Fourth, the full-cost method applies a flat percentage to the total cost of each product to allow for profit. This is generally expressed in terms of an established percentage of the selling price or cost of the product. The procedure, at least in theory, fails to recognize that all products are not able to earn the same rate of profit. It also fails to distinguish among the cost elements that generate profit. For example, if purchased materials constitute a larger portion of the total cost of a particular product, it may not be reasonable to assume that this product should earn a profit margin equal to other items which have less material content but require a proportionately greater share of the factory labor, management and facilities.

The Return-on-Investment Method

Under the full-cost method no consideration is given to the capital investment required to produce, finance and distribute products or product lines. Yet the real measure of the efficiency of a business is the return being earned on invested capital. Giving effect to invested capital in pricing products is particularly important in multi-product plants where varying capital investments are required for the different products. Failure to recognize an imputed interest cost under such circumstances may produce an unbalanced price structure and result in an insufficient recovery of funds to provide for dividends and growth. An example of the use of the return-on-investment method appears below. It will be noted that while both products yield a 23.1 percent return on sales, Product Y shows a 21.6 percent return on capital as compared with only 13.6 percent for Product X.

FULL-COSTING METHOD
(RETURN ON INVESTMENT)

Capital required:

	Product X (Sales Budget $530,400)		*Product Y (Sales Budget $982,800)*	
	Fixed Capital	*Variable Capital (% of Sales)*	*Fixed Capital*	*Variable Capital (% of Sales)*
Cash	$ 5,000	4.71	$ 5,000	3.56
Receivables	—	16.96	—	10.17
Inventories	50,000	33.93	100,000	25.44
Fixed Assets	550,000	—	560,000	—
	$605,000	55.6%	$665,000	39.17%

Comparison of Return on Sales and Return on Investment Methods:

		Product X	*Product Y*
Budgeted Sales	(20,000 @ $26.52)	$530,400	
	(30,000 @ $32.76)		$ 982,800
Budgeted Costs	(20,000 @ $20.40)	408,000	
	(30,000 @ $25.20)		756,000
Budgeted Profit		$122,400	$226,800
Average annual capital required		$900,000	$1,050,000
Pre-tax return on capital		13.6%	21.6%
Pre-tax return on sales		23.1%	23.1%

Before turning to the third method for using costs as an aid to pricing, it should be mentioned that the more widespread use of the return-on-investment method has been impeded by three technical difficulties: (1) the selection of the assets to be included in the investment base, (2) the method of valuing these assets and (3) the techniques for allocating certain of them to product lines or products. Much of the controversy in these areas appears to arise from the search for a single ubiquitous criterium that presumably will serve equally well for the several different uses of the return-on-investment calculation. This approach hardly seems realistic. If the calculation is being made with a view toward the status of investors, then the return on total invested capital becomes significant. If the efficiency of an operating unit is measured, then only those capital assets directly used by this sector of the firm would appear to be relevant. Similarly, in attempting to evaluate the relative profitability of products or product lines, the capital investment directly chargeable to these items provides the most accurate guide.

The really troublesome aspect of the return-on-investment criterium is the determination of the value of the capital assets employed. Clearly, the only valid basis is the economic value of the assets used. Though, unfortunately, this cannot be determined precisely in a going business, the use of price-adjusted asset costs provides a realistic alternative. It is somewhat surprising, therefore, that so few of our larger companies that use the return-on-investment method have been willing to experiment with this approach. This does not imply that use of asset book-values has no significance. In situations where the product or product line capital investment has not been greatly affected by price fluctuations the use of acquisition cost less depreciation may prove adequate.

The Marginal Costing Method

Let us now examine the use of marginal costing as a basis for establishing

product prices. "Marginal" or "differential costs" are added costs that can be directly associated with a particular product, product line or other segment of a business, since they would not be incurred if the product were eliminated. From a pricing standpoint, they generally include variable costs and the variable element of semi-variable costs. The illustration below shows how product X of our previous examples would appear under marginal costing.

MARGINAL COSTING

	Product X	
Raw materials	$8.00	
Direct labor	3.00	
Variable factory overhead	2.25	
Variable selling and administrative	.75	
Total marginal costs	$14.00	out-of-pocket recovery price
Fixed costs directly chargeable to product	2.80	
Total marginal & direct fixed costs	$16.80	product carrying price
Allocated fixed costs	3.60	
Total costs	$20.40	full-cost minimum recovery price

The out-of-pocket recovery price is the minimum price below which a cash loss will be sustained. The product carrying price may be regarded as the long-run minimum price necessary to recover the cash costs as well as those fixed costs directly related to the manufacture and distribution of a product. The full-cost recovery price represents the desired minimum long-run price which will permit the product to recover its direct costs as well as its proportionate share of the company's over-all fixed costs.

In marginal costing, the marginal ratio, the percentage relationship between the marginal profit and the selling price, is important. It indicates which products will yield the largest cash profit in the short run, that is, before giving consideration to asset replacement and other continuing fixed costs. Under marginal costing we start with the premise that any contribution toward the recovery of fixed costs and profit is better than none.

We often gain the impression that a conflict exists between full costing and marginal costing as a basis for pricing. While accountants may argue vigorously as to the propriety of "direct costing" as a basis for income determination, there can be no argument as to the usefulness of marginal costing in product pricing. Under certain conditions a knowledge of marginal product

EXHIBIT 1

Example of a Company's Use of Marginal Costing

Product Z

	Last quarter-Actual Per cwt.	% to sales	Next quarter-Budget Per cwt.	% to sales	Comments
Raw materials (itemized)	$ 7.60	29.12	$ 7.74	28.89	Prices of raw materials expected to increase (as indicated).
Packaging	2.51	9.62	2.51	9.36	
Manufacturing labor (itemized)	2.33	8.93	2.45	9.14	
Holidays, sick leave, vacations, etc.	.55	2.14	.59	2.20	Wage rates expected to increase 5%.
Factory repairs and maintenance	1.20*	4.59	1.20	4.48	
Other variable factory overhead (per cwt. net)	.25	.96	.25	.93	* Based on the most recent twelve-month period.
Variable delivery and warehousing (per cwt. gross)	1.60	6.13	1.60	5.97	
Variable commissions & discounts (per sales $)	2.61	10.00	2.68	10.00	
Total variable costs	$18.65	71.49	$19.02	70.97	
Selling price	26.10	100.00	26.80	100.00	Price increased $. 70 per cwt.
Contribution to fixed overhead & profit	$ 7.45	28.51	$ 7.78	29.03	
Fixed costs					
Factory (per cwt. net)	$ 1.26		$ 1.29		Increase in fixed costs results from an expected decline in volume during the next quarter.
Delivery & warehousing (per cwt. gross)	1.46		1.48		
Other selling (per sales $)	1.80		1.89		
Advertising (per sales $)	.44		.46		
Total fixed costs	$ 4.96	19.00	$ 5.12	19.10	
Net profit	$ 2.49	9.51	$ 2.66	9.93	

costs is indispensable to the pricing executive: first, where excess plant capacity exists that cannot be absorbed by the regular sales outlets; second, where it is possible to increase the level of operations by selling products at reduced prices, generally to a different class of customers; third, where these additional sales at reduced prices do not endanger relations with regular customers. Indiscriminate reliance on marginal costs can be dangerous and companies using this plan should make certain that their pricing executives are thoroughly aware of the pitfalls as well as the advantages of the method.

An interesting example of the use of marginal costing by a large company in a highly competitive industry appears in Exhibit 1. This company constantly projects its costs three months ahead on the basis of past trends and a careful evaluation of the probability of cost changes. A special group of analysts in the controller's department prepares this data and forwards a copy to the pricing executive when significant cost changes appear. Exhibit 1 indicates the nature, extent and effect of anticipated cost changes during the forthcoming quarter. The pricing executive will then reappraise the probable market situation in the light of these cost trends and, where desirable, modify the products' selling price. In such short-run adjustments of prices no consideration is given to the increase in fixed costs per unit as a consequence of temporarily operating at a below-normal level of operations. An increase in unit costs of this type obviously cannot be passed on to consumers. As a matter of fact, the reverse is more apt to apply and it may be necessary, where elasticity of demand exists, to reduce prices in order to stimulate sales. This company does not calculate the return on the invested capital applicable to each product because no significant variation in the utilization of capital among the products exists.

Flexible Cost Data Preferable

We have now examined the three principal methods for using costs as an aid to price setting. These methods are not mutually exclusive, in fact, the most effective system is one that combines all the three methods and provides pricing executives with flexible cost data that can be used to solve the particular type of pricing problem that exists. An example of such a flexible cost system appears in Exhibit 2. The marginal ratio (Line 5) is useful for short-run pricing decisions, since it reveals the extent to which prices can be reduced before reaching the out-of-pocket minimum. In this connection, it will be noted (Line 19) that cost center No. 2 is operating substantially below capacity and that consideration should be given to seeking new outlets for Products C and D at reduced prices or even lowering the price to regular customers if the

EXHIBIT 2

Flexible Costs							
		Cost Center #1			Cost Center #2		
Line		Product A	Product B	Total	Product C	Product D	Total
1	Net sales	$6,800,000	$ 680,000	$7,480,000	$3,250,000	$1,625,000	$4,875,000
2	% of total sales in cost center	90.9	9.1	100.	66.7	33.3	100
3	% of total plant sales	55.1	5.5	60.6	26.3	13.1	39.4
4	Marginal contribution	$3,128,000	$ 346,800	$3,474,800	$1,368,300	$ 721,500	$2,089,800
5	Marginal ratio (4 ÷ 1)	46.0	51.0	46.4	42.1	44.4	42.9
6	Direct fixed costs	$ 700,000	$ 60,000	$ 760,000	$ 200,000	$ 150,000	$ 350,000
7	Profit before allocated fixed costs (4 - 6)	$2,428,000	$ 286,800	$2,714,800	$1,168,300	$ 571,500	$1,739,800
8	% profit before allocated fixed costs (7 ÷ 1)	35.7	42.2	36.3	35.9	35.2	35.7
9	Allocated fixed costs	$1,100,000	$ 110,000	$1,210,000	$ 850,000	$ 310,000	$1,160,000
10	Pre tax net profit (7 - 9)	$1,328,000	$ 176,800	$1,504,800	$ 318,300	$ 261,500	$ 579,800
11	% pre tax net profit (10 ÷ 1)	19.5	26.0	20.1	9.8	16.1	11.9
12	Direct capital used (direct fixed assets, receivables, inventory)	$2,700,000	$ 380,000	$3,080,000	$1,200,000	$ 430,000	$1,630,000
13	Direct capital turnover (1 ÷ 12)	2.52	1.79	2.42	2.71	3.78	2.99
14	Return of profit before allocated fixed costs on direct capital (7 - 12)	89.9	75.5	88.1	97.4	132.9	106.8
15	Indirect capital			$2,800,000			$1,800,000
16	Total capital investment (12 + 15)			$5,880,000			$3,430,000
17	Total pre-tax return on total capital (10 ÷ 16)			25.6			16.9
18	Total capital turnover (1 ÷ 16)			1.27			1.42
19	Cost center % of capacity (2 shifts)			85.0			60.0

demand for these products is relatively elastic. Line 11 shows the return on sales under full costing. This would be useful in long-run pricing if invested capital did not vary significantly between products. In this example, however, Line 14 "return of profit before allocated fixed costs on direct capital used" has greater significance. The exclusion of both allocated fixed costs and allocated capital prevents controversy regarding the method of allocation and results in a more precise reflection of a product's profitability. It will be noted that Product B, which has the highest marginal ratio (Line 5) and return before allocated fixed costs (Line 8), has the lowest return of profit before allocated fixed costs on the direct capital used (Line 14). The reason for this condition is evidently due to the low capital turnover (Line 13). The company may now explore the various possibilities for improving the capital turnover of this product. These are merely indicative of the different pricing and related decisions that can be resolved through the use of flexible cost data.

"Auditing Through" EDP Equipment

by ROBERT N. TROMBLY*

SINCE the introduction of electronic data processing systems several problems have arisen with respect to what reasonable and proper financial controls can be developed to verify this new method of keeping records. In many instances, the installation of EDP equipment has caused conjecture on the part of auditors and controllers alike, who feel that it is absolutely necessary to identify, isolate and trace back to its origin every transaction which affects either the balance sheet or the income statement. On the other hand, these "machines with a memory" have been advanced and developed to such an extent that, upon receipt of a single transaction or piece of information, all the effects of this transaction can be reported, with all necessary manipulations, summarizations and comparisons completed. This internal manipulation feature of EDP machines, along with their phenomenal speed and ability to make "yes-no" logical decisions, has resulted in the creation of a new challenge not only to auditors, who must verify the accuracy of a business' records, but also to the management of the business. The challenge to the auditor has only begun to show and in most instances he has had no difficulty in adapting himself to the changes in record keeping thus far brought about. The challenge to management is yet to come and the timeliness of its recognition will depend upon management's willingness to accept the concept of complete integration in information handling. It is probable that EDP equipment will have a full and far-reaching effect upon financial control long before it reaches any great degree of sophistication in the overall operation of total business systems. This is perhaps due to the nature of financial information, with its general characteristics of (1) inflexible rules of operation, (2) consistency, (3) mass volume of data, (4) speed in handling and (5) numerical results.

In any event, a revolution in the characteristics and need for clerical work has begun. Its effects have already been felt in the businesses which, in one way or another, have embraced the electronic "brain." Because, as mentioned before, the preliminary contact with business information so processed has been largely concentrated in the financial area, auditors, controllers and the rest of financial management have so far been the ones who have had to learn to adapt themselves to the new problems created by these machines.

The problems have essentially

*Procedures Analyst, General Electric, Medium Steam Turbine, Generator and Gear Department, Lynn, Massachusetts.

evolved around the characteristics of internal manipulation of data and consequent loss of "audit trail." The responsibility for control of (1) input of data to the machine, (2) people operating the machine, (3) people programming the machine, (4) the reliability of the machine, (5) the instructions given to the machine and (6) the output generated by the machine, resides solely in the hands of the controller. The auditor, being his chief delegate in the area of verification, must face each of these points and, after proper investigation, must be able to report on the validity and accuracy of the financial records produced by the machine. In order to do this, he must maintain a balance between the time-honored auditing techniques he is familiar with and the imaginative techniques that must be developed if the full benefits of EDP equipment are to be gained. I would like to cover each of the six points of control just mentioned and suggest the possible approach to verification of accuracy and propriety in each.

Input of data. Original documents, whether they be labor vouchers, time cards, vendor invoices, stock requisitions or sales slips, represent the supporting evidence behind all business transactions. They have a permanent effect upon financial records involving the payment or receipt of funds. It is, therefore, absolutely essential that these original documents be regulated by the fundamental, time-tested principles of internal control that the auditor has always insisted upon, especially with respect to verification of amounts, approvals, extensions, etc. Once this is done and the data is ready for input, steps must be taken to ensure that accurate data is fed to the machine. There are many new techniques already developed for this sort of control. These techniques have been in effect since the advent of basic punched card applications. They include control tape totals, batch totals, hash totals, self-checking numbers, etc. The importance of this type of control is that it is derived and maintained outside of or independent from the machine and its operating personnel. Thus, as in any good control procedure, the kind of procedure providing division of responsibility, coupled with the other control techniques mentioned above, do much to avoid inaccuracies or perpetuation of fraud.

People operating the machines. One point often forgotten during the establishment of an electronic data processing system is that the personnel engaged in operating the equipment suddenly find themselves in a position of trust. Their proximity to and familiarity with punched or taped data might possibly lead them astray and cause them to violate this position of trust. Certain control procedures that can be taken are of the type already familiar in any good system of internal accounting control. Division of responsibility, rotation of work as-

signments, careful screening and recruiting policies, and protection by fidelity bond are some of them. Once again, with respect to controls we find that time-tested auditing principles are still the best method of assuring accuracy and propriety.

People programming the machines. We have included this group of people as an individual group to be dealt with because in an EDP installation, unlike a punched card installation, the machine operators seldom possess the technical knowledge required to program the computer. However, it is obvious that programmers also occupy a position of trust and should certainly have the same types of controls exercised over them as the operators' group. In addition to this, and perhaps most important of all, strict control should be exercised over any change in machine programs and all changes should be reviewed with the auditor, both before and after they are made. Once again, it is to be noted that the controls needed are no different from those required prior to the advent of EDP equipment.

Reliability of the machine. Manufacturers of computers, being acutely aware of some of the problems of good control, have developed many controls which can be exercised over the data being processed and, if understood by the auditor, can be used to improve the chances of accuracy in any financial program being processed. These controls may be subdivided into two sections: those which are initiated by the programmer's instructions and those which are built into the machine itself.

Of the first group, an auditor can really contribute to the strengthening of an operation's accuracy by working with the programmer to provide some or all of the following controls: (a) record count, where the machine automatically records the number of people paid or the number of invoices paid or number of sales slips processed; (b) limit check, which can be inserted into the machine to guarantee that no transaction calculation exceeds a certain amount, for example, in a pay-roll application where a certain limit should not be exceeded; (c) reverse multiplication, where the machine multiplies the multiplicand and the multiplier again and subtracts the product already derived to ensure a "check total" of zero. Other types of program checks which may or may not be utilized, too technical to be covered here, are proof figures, cross-footing balance checks, use of check points, self-checking numbers, sequence checks, and labels.[1]

Included in the second category of controls, namely, those built into the machine, we have things like the parity bit check, which guarantees the accuracy of information being passed

[1] *The Auditor Encounters Electronic Data Processing*, Price Waterhouse & Co., published by the IBM Corporation.

from one section of the internal mechanism to the other, double-track recording and reading, which guarantee accuracy by reading and recording data twice. There are other controls in existence, also, such as maintenance checks, duplicate circuitry and double arithmetic.[2] These kinds of controls represent an innovation to the auditor and every effort should be made to utilize them to their fullest in order to provide a well-controlled program of operation.

Instructions given to the machine. At this point the field of auditing and control divides into two distinct camps, one group heavily outnumbering the other. The majority of those in auditing and control are in favor of complete maintenance of the so-called "audit trail." They demand that the machine print out long and voluminous records of each and every transaction processed, showing proper references to original documents, along with whatever calculations or manipulations have been performed. This type of "transaction-print-out" places a burden upon the equipment and also most certainly reduces some of the savings which could be realized were the machine allowed to manipulate whole batches of data internally, reporting results only in the required final summarized form. The minority, those who are oriented towards electronic systems, are in favor of eliminating unnecessary print-outs of detailed transactions and, instead, devoting control procedures to auditing through the machine rather than around it. To quote a recent article:

> "First and foremost, the auditor should recognize the importance of the electronic procedures—the significance of the portion of the work which is actually performed within the EDP machines themselves—and resist the tendency to 'audit around' or 'leap frog' the machine system."[3]

All this would seem to indicate that the auditor must familiarize himself with the machine instructions or "program." This does not mean to imply that he must become an electronic wizard, but it does indicate that he should be striving for complete understanding of how the program will cause the machine to react under any and all conditions. I am suggesting that a bit of innovation here by the auditor will not only guarantee good control but also take advantage of the inherent benefits derived from the suppression of insignificant detail, now permitted with this equipment. This innovation can be categorized into three separate areas: (a) design and preparation of test conditions by the auditor, (b) the test check or sample theory applied to internal processing and (c) control by exception. Although these things may not be thought of as new, they are not in

[2] *Ibid.*

[3] "The Auditor and EDP", Arthur B. Toan, Jr., *The Journal of Accountancy*, June, 1960.

general use today, applied specifically to electronic data processing machines, as I suggest here. Let us examine these areas one at a time and see how "auditing through" a system might be beneficial to the control function.

1. *Design and preparation of test conditions by the auditor.* Empirically, the auditor has tested the system of internal control by selecting specific transactions and tracing them through each step back to the supporting evidence residing in the original document. It would seem that the system of internal control could be equally verified by designing test blocks of data with predetermined results and introducing them into the system in order to test whether the system arrives at the same results as the predetermined ones. Here the auditor must use ingenuity to come up with a valid test covering all of the possible conditions. It should be noted that there is no great degree of technical knowledge of systems required. The verification that the computer has arrived at the same results as those predetermined by the auditor, would indicate that the system of processing is properly endowed with internal controls.
2. *The test check or sample theory applied to internal processing.* The auditor can utilize the computer during a processing cycle by having it report the contents of its storage unit with respect to transactions being processed or stored information being used on an "as required" basis. He can then proceed to use this information as a sample, tracing it back to original documents or records. An example of this would be to have the computer print out the stored wage rate information of a selected group of employees, upon which these could then be traced back to original authorized documents.
3. *Control by exception.* Control by exception is certainly used to a great degree by controllers, but in this case we could even go further in that our tests and audits of effectiveness could be designed to be done on the same basis, utilizing the equipment to report what is abnormal and warranting attention or scrutiny. It is in this area and in the next to be discussed that the accountant faces the biggest challenge. His ability to make these and other innovations in the verification of control will play an important part in the speed with which the handling of information on computers will become extensive practice.

The output generated by the machine. In this area lies perhaps the greatest challenge to the finance man. He now has the capacity of becoming even more important to the management team if he is willing to seek new and better ways to present business results, making use of the machine in

every way he can. He can do this through a constant search for better reporting. The controller's efforts in this direction will serve to further verify accuracy and propriety since good reporting suppresses the insignificant and outlines that which needs attention.

The true effect of EDP equipment upon financial control thus far has been limited to the larger corporations who have largely pioneered its applications into financial data processing. I do not believe that we can either cast aside completely our time-honored techniques of control maintenance or live and progress solely with them. The next ten years will be a period of trial and experiment, during which many old techniques will be retained and others cast aside for newer and more imaginative ones. I believe we will find that in the final analysis "auditing through" machine or system is the only truly effective means to maintain control and still reap benefits from electronic equipment. Our challenge lies in the development of newer and better auditing and control techniques in order to accomplish this.

Cost Control Charts—An Application of Statistical Techniques

by DEWEY W. NEAL

IN A PROFESSION such as accounting, that has made significant advancements, the development of new techniques has not been uncommon. This has been brought about by the great expansion of industrial activity, the increase of government influence in the affairs of business and the unending search for higher productivity in industry. The accountant has maintained and advanced his position of usefulness through his ability to provide services which are essential to any going concern. Today, he is called upon to render services which are in many respects different from the normal accounting services. Thus, the private accountant is not only given the task of providing adequate records but he is also called upon to prepare and submit a multitude of reports to management which are primarily designed to aid management in control over operations and in long-range decision making.

Placing more and more emphasis on the use of scientific techniques for control, management has accepted the use of statistical techniques in assisting in decision-making processes. Therefore, the accountant must learn just where and how to apply such techniques to his accounting procedures. One of the statistical techniques available to the accountant is the control of materials wastage through statistical quality control.

Recently, marked progress has been made in the application of statistical techniques to cost control through the use of cost control charts which may point out weaknesses in a cost structure. These weaknesses can be spotted during an actual operation through a system of selective sampling which may reveal variations from a standard, that might otherwise go undetected.

The Problem Scrutinized—a Method Developed

The A.B.C. Wastebasket Company manufactures six different varieties of wastebaskets, each of which is available in six different colors. The baskets are similar in size on the inside and a standard size liner will fit any one of the six styles. The company employs nine people to handle these lining duties. Based on studies of the lining process, the following standard costs were developed.

DEWEY W. NEAL, Wichita Chapter, 1958, is a Project Cost Coordinator, Boeing Airplane Company, Wichita Division, Wichita, Kansas

STANDARD COST

Description	*Quantity*	*Unit cost*	*Total cost*
Pressboard side-liner	1	$.20	$.20
Bottom liner	1	.05	.05
Heavy-duty staples	6	.005	.03
Glue	1 oz.	.01	.01
Labels	1	.02	.02
Total standard cost			$.31

The lining supervisor requisitions all material, keeps a daily record of wastebaskets lined by style and color, checks the previous day's fabrication schedule to determine what will be coming in for lining the following day and prepares wastage reports for cost accounting.

Because the supervisor finds it more and more difficult to account for the variance between actual weekly costs and the standard cost in the time alloted to him, he seeks assistance from the accountant. The accountant tackles the job of finding a method by which the variance will be quickly explained and which will indicate the exact cause of this variance. The following plan was developed to discover whether control over material lining cost could be accomplished by applying statistical quality control techniques:

1. Select a random sample of ten wastebaskets from each day's workload for a period of ten days.
2. Compute the control limits within which the lining costs would be accepted as satisfactory.
3. Prepare control charts.
4. Take a daily sample of ten lining operations from each day's workload after the control charts have been prepared.
5. Prepare an analysis of the function of the control chart and the technique as related to material cost control.

As the first step, the actual materials cost of the wastebaskets being lined was sampled as follows:

ACTUAL LINING MATERIALS COST

Days	*Samples*										*Cost av.*	*Cost range*
	1	2	3	4	5	6	7	8	9	10	*"A"*	*"R"*
1	.29	.28	.28	.29	.27	.28	.30	.29	.31	.32	.291	.05
2	.36	.32	.33	.32	.31	.31	.30	.32	.31	.31	.319	.06
3	.32	.31	.29	.28	.29	.29	.27	.26	.28	.29	.288	.06

4	.25	.27	.26	.30	.31	.30	.29	.28	.28	.29	.283	.06
5	.35	.30	.33	.29	.27	.39	.33	.29	.25	.26	.306	.03
6	.35	.30	.33	.29	.27	.39	.33	.29	.25	.26	.306	.14
7	.28	.27	.28	.29	.30	.30	.29	.29	.30	.30	.290	.03
8	.31	.30	.31	.31	.28	.27	.27	.28	.30	.29	.292	.04
9	.23	.35	.32	.31	.30	.31	.30	.29	.25	.27	.293	.12
10	.27	.28	.28	.30	.29	.27	.29	.31	.27	.27	.283	.04
	Total averages										$.2933	$.063

Second, the control limits within which the materials lining costs would be considered as satisfactory were computed. This was determined by applying the concept of standard deviation which is described as a measure of the dispersion of values within a population from the mean average value of the population. This concept is based on the proven fact that in any normal distribution, the following dispersion of data will occur:

Standard deviation	*Percent dispersion*
± 1	68 %
± 2	95 %
± 3	99.7%

For example, if an average group of measurements is five and the standard deviation is one, then 99.7 percent of the individual measurements should fall within the range of two to eight (5 ± 3). The difference between one, two and three standard deviations is that each signifies two points on a normal curve. An item whose value falls within one standard deviation of the mean, or average, has a numerical value that is closer to the average value of all the items than does an item whose value falls within two or three standard deviations away from the average of all the values.

Based on the sampling of standard cost, the frequency distribution of the one hundred liners was examined in comparison to the normal distribution as shown in Exhibit 1. Since the frequency distribution shows that the distribution of lining costs around the average lining unit cost has assumed a normal distribution, we can safely say that 99.7 percent of the unit lining costs will normally fall within three standard deviations above and below the average unit cost. These then are established as the control limits for the study, so we can proceed to determine the numerical value of these limits. Determination of these limits is greatly simplified by the use of tables of factors for computing control chart limits. The computations of the control limits are as follows:

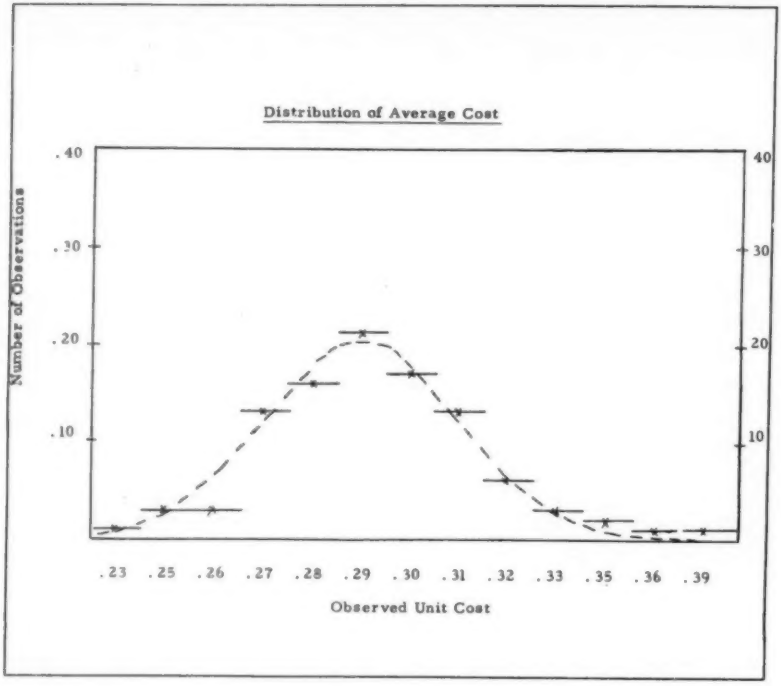


EXHIBIT 1

1. *Average price upper and lower control limits:*

Control limits	= "A" ± ("R" × Factor from table)
	= .2933 ± (.063 × .308)
UCL	= .2933 + .0194 = .3127
LCL	= .2933 − .0194 = .2739

2. *Cost range upper and lower control limits:*

Control limits	= "R" × Factor from table
UCL	= .063 × 1.777 = .1120
LCL	= .063 × .223 = .0140

Third, control charts are prepared based on steps 1 and 2. From the Average Cost Control Limits (Exhibit 2), it can be seen that all the ten samples' averages fall within the upper and lower control limits, with the exception of Sample 2. This average falls just outside the upper control limit and could be considered

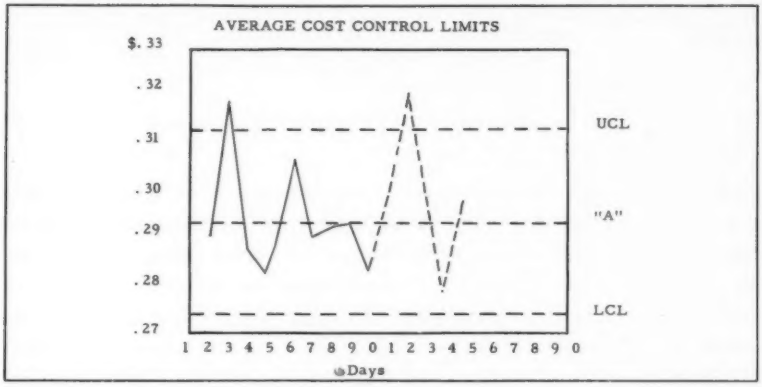


EXHIBIT 2

as being out of control. In the Average Range Control Limits (Exhibit 3), Sample Average 6 appears to be considerably above the upper control limit, which would indicate an out-of-control condition. The sample average range for the ninth day would appear to be on the marginal side.

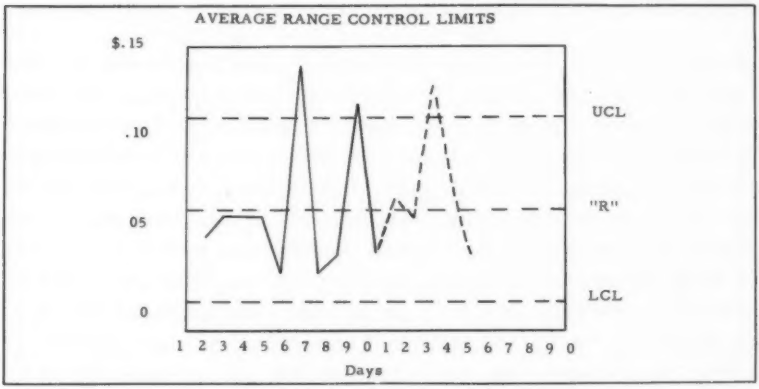


EXHIBIT 3

The fourth step is to take a daily sample for five days of ten liners from each day's workload, check the lining material costs, compute the Sample Average "A" and the Range "R" and to plot these averages on the control charts. The daily samples for the five days were recorded as follows:

Day	*"A"*	*"R"*
11	.299	.07
12	.321	.06
13	.301	.13
14	.279	.08
15	.298	.04

The above averages were computed in the same manner as those in the table of actual lining material cost. The dotted lines on the control charts show where these five samples have been plotted. Sample 12 has an average of .321, and indicates an out-of-control situation. It was found that there was an excess of glue and heavy-duty tape being used. This excess usage was stopped, and the average for Sample 13 fell back within the limits of the control chart. Even though the average cost did drop back within the control chart limits on Sample 13, its cost range appeared wide. The reason for the wide range was found to be that a new employee had been placing too many labels on some liners and no labels on others. The employee was informed by his supervisor of the proper method of applying labels and, as a result, Sample 14 returned within the acceptable limits again.

Day-by-Day Control

It was determined that this type of statistical method would prove beneficial to the supervisor in preparing his analysis of cost variance, would provide direct control over lining expenses on a daily basis and should reduce material wastage. The advantage of this type of cost control technique results from the control of costs on a daily basis instead of a weekly or monthly basis. It should be apparent that, over an extended period of time, there will be some days when lining costs are above the standard material cost and other days when these costs will fall below the standard. By using this method of measuring cost it will be known just when these days occur. As a result, cause can be determined so that immediate action can be initiated. If cost analysis is left on a weekly or monthly basis, the costs may average out, and daily cost variances will not be noticed or may not receive adequate explanation.

The justification for using this type of statistical device must be based on the relative value of the cost being measured versus the cost of applying this technique. The lining materials cost may be considered relatively minor in the sample illustration used here; however, the reduction or elimination of waste material over a period of time could be significant.

Manufacturing Expenses—A Burden or Not?

by RAYMOND D. BEHRMANN

BURDEN as a term to describe manufacturing expense allocable to prime costs has been rapidly falling into disrepute with most accountants. The word connotates something different, a problem, something that should be done away with, if possible. Manufacturing expenses are not unnecessary expenses but are as important a cost factor as material and direct labor and certainly should not bear a stigma. However, to the accountant of a small business, manufacturing expenses are quite often a real burden. It is to this group—the accountants of small businesses—that I direct this article. To the comptroller, cost accountant or division accountant of a large corporation, the procedure presented will seem too basic and fundamental, but the fact he must remember is that the accountant of a smaller business does not always enjoy the background, management cooperation and understanding, or interdepartmental cooperation which the large-corporation accountant enjoys.

As the Business Grew . . .

The following case study is not a hypothetical one, but, rather, a composite of many engagements that I have experienced over the past years. This company, the ABC Manufacturing Company, was started soon after World War II by two enterprising young men, one with an engineering background, the other a salesman. The engineer had developed an integral part for a residential plumbing system—in great demand during the housing boom. Since the two had very little capital with which to buy equipment, many parts of the product were subcontracted and the company's own contribution to the manufacturing process was one of assembly with only a minor amount of machining. Profits were fantastic, new orders were constantly ahead of production and it appeared that the company would have no problems.

In the early days, the bookkeeping was extremely simple and limited to one or two clerks. As the business grew, the company decided to expand operations and started to buy machinery to do its own machining and to lessen the dependence on the subcontractors. A young business college graduate was hired as full-time office manager and accountant and, with the help of the

RAYMOND D. BEHRMANN, Indianapolis Chapter, 1955, is Manager, Management Services Division of the Indianapolis office of Ernst & Ernst, C.P.A.'s. He attended Valparaiso University and the Pratt Institute of Technology.

accounting firm which prepared the corporation's Federal income tax return, a simple standard cost system was established.

After the Korean conflict, the company experienced a decline in sales and profits. This decline was due principally to increased competition. The two principals "hit the panic button" and cut expenses drastically and, while the young office manager was retained, his bookkeeping staff was reduced to the minimum and the standard cost system disappeared, never really understood or appreciated.

After the drastic cut-back, the two young businessmen realized that, if they wanted the company to continue to grow, they would have to develop new products. Several new ideas were applied to the general manufacturing processes of the initial product and a new process was developed for still another product. To go into production it was necessary to obtain sizable bank loans to buy specialized machinery to establish a production line. To continue to expand the production line and to produce this new product in various sizes, additional machinery for the machine shop was also needed. Realizing that the company's internal consumption of its machine shop production would not keep the department operating full time, they also entered the subcontract field.

Deficiencies Came Up

After being in production for several months the founders realized they had forgotten to ask, "What are our costs on the various products?" and, as well, "How do we price these various products?" Materials costs were known from costing bills of materials, and the engineer member of the team knew generally the direct labor hours involved in producing each product. These he extended at the average labor rate for the entire shop. But, what about manufacturing overhead?

The inexperienced young accountant who now lacked the guidance of the accounting firm (victim of the expense cut-back), presented his management with the detail of manufacturing expenses on a plant-wide basis. By applying the corresponding rate to the direct labor as arrived at by the engineer, selling prices were set. This method showed some strange variations in product sales prices when compared to those of competition. Some were higher, some were lower. The sales member of the team was very happy with prices when they were lower than a competitor's prices and left them alone. In the case of the higher sales prices, he immediately lowered them to meet competition. Sales increased, production boomed, but, at the end of the year, a loss resulted. The principals were dismayed. They decided that the product costs must be wrong. Whom else to blame but the accountant? After all, he was the man who gave

them the figures. And so, the age-old and entirely justifiable demand "You must give more accurate cost information."

This young accountant knew in his own mind that there was something wrong with the use of a plant-wide manufacturing expense rate, but was not too sure of how to approach the problem. He suggested that the accounting firm previously employed by the company be called in again. His request was turned down—too expensive, too much paper work would increase clerical staff.

A friend of his in the accounting firm then suggested that his first step should be to change his chart of accounts to allow costs and expenses to fall into departmental or cost center expense classifications. Armed with this information and the variances it would probably produce, he could then approach management and point out the advantage of a complete cost system. His friend also suggested several good cost manuals to read.

And a Challenge for the Accountant

After reading the manuals the accountant immediately began to revise his chart of accounts and to distribute expenses into departmental manufacturing classifications. He knew, however, that it would take some time to develop any meaningful figures, so he decided to try to redistribute as best as possible the following year-to-date manufacturing expenses to conform to the new chart of accounts:

MANUFACTURING COSTS

Period of ten months ended October 31, 1960

Direct labor	$ 62,500
Manufacturing expenses:	
Indirect labor	63,500
Repair and maintenance—building	4,600
Repair and maintenance—machinery	16,700
Manufacturing supplies	14,700
Perishable tools	11,600
Shipping department supplies	2,400
Heat, light, and power	11,800
Water	400
Provision for depreciation—building	10,400
Provision for depreciation—machinery and equipment	33,000
General insurance	3,900
Property taxes	3,500
Pay roll taxes and other pay roll benefits	11,000
	$187,500
Manufacturing overhead rate to direct labor dollar	300%

By analysis of the old accounts, personnel records, depreciation records, etc., he was able to prepare the breakdown of expenses as shown in Exhibit 1.

MANUFACTURING COST

Period of ten months ended October 31, 1960

	Assembly	Machine Shop	Production Department	General Manufacturing	Occupancy	Material Handling	Total
Direct labor rate	$1.50	$2.50	$2.00	-o-	-o-	-o-	-o-
Direct labor	$22,000	$12,000	$28,500	$ -o-	$ -o-	$ -o-	$ 62,500
Manufacturing expenses:							
Indirect labor	$13,000	$ 4,800	$22,300	$ 12,000	$ 4,200	$ 7,200	$ 63,500
Repairs and maintenance - building					4,600		4,600
Repairs and maintenance - machinery and equipment	4,400	500	11,700	100			16,700
Manufacturing supplies	2,100	1,100	10,200	1,300			14,700
Perishable tools	3,400	2,100	5,800	300			11,600
Shipping department supplies						2,400	2,400
Heat, light, and power		3,000	6,000		2,800		11,800
Water				400			400
Provision for depreciation - building					10,400		10,400
Provision for depreciation - machinery and equipment	2,000	13,000	16,000	2,000			33,000
Insurance					3,900		3,900
Property taxes					3,500		3,500
Pay roll taxes and other pay roll benefits				11,000			11,000
TOTALS	$24,900	$24,500	$72,000	$ 27,100	$ 29,400	$ 9,600	$187,500
Allocation of general manufacturing expense on the basis of total labor	8,400	4,100	12,200	(27,100)	800	1,600	-o-
Allocation of occupancy expense on the basis of floor space	9,000	6,000	12,200		(30,200)	3,000	-o-
ADJUSTED TOTAL	$42,300	$34,600	$96,400	$ -o-	$ -o-	$14,200	$187,500
Manufacturing expense to direct labor dollar	192%	288%	338%				
Material handling expense ratio to the cost of material sold during period						6%	

EXHIBIT 1

He also experimented with several other bases of applying manufacturing expense, such as machine hours but, after reviewing the different manufacturing processes with the production manager, he decided that the application to direct labor dollars was fairly equitable. Before presenting his exhibits to management he prepared comparative cost analyses of several of the company's major products, using first the company's old method of an average labor rate and a plant-wide manufacturing expense rate and then the new departmental labor and manufacturing expense rates plus the application of the material handling rate. The results astounded him and he proudly carried his reports to management.

Needless to say, management was well pleased. The accountant, no longer with his back to the wall, was quick to pursue his advantage. He tried to point out that with better labor reporting he could break down the unknown indirect

labor amount into meaningful classification which might help management better control these costs. By having the direct labor personnel report actual production by part or operation, it could be matched against the estimated standards as set by the engineering member of management's team. This comparison would break out the variances from standard and give management a valuable tool for corrective action. He further pointed out that the new manufacturing rates were based on actual costs, and that he would recommend that they be reviewed by the outside accounting firm so that such cost factors as fixed, variable and semi-variable expenses and departmental capacities might be taken into consideration to set better departmental or cost center rates.

When asked for an estimate of the cost of the program, he stated that, with management's cooperation, an additional clerk to handle the labor costing and distribution, and several weeks of consultation with the accounting firm, he thought the program could be implemented. Management refused again. "With nothing but losses, how can we increase our clerical staff and bring in costly experts?" And the production manager too was against bringing "paper work into his shop" for the labor reporting.

Management, however, did begin to use the new cost schedule in computing selling prices. After a period of time the accountant noticed a shift in the sales mix of his company as a result of the new sale prices. Another result was black figures at the bottom of the income statement. Feeling that the climate would be once more favorable, he began to include in the monthly report his estimates of over and under-absorbed manufacturing expenses and of direct labor variances from the estimated direct labor hours, obtained by a review of products produced during the period. These figures were of course hard to prove, but equally hard to disprove from the records available; they did whet management's appetite. It did not surprise him a great deal when he was given the "green light" to hire a cost clerk and to start labor reporting. With the help of the production manager and the engineer, the labor reporting and the measurement of direct labor time against the estimated standards began.

Here again, the results were amazing to all concerned. With the data flowing from the cost clerk, the production manager and engineer attacked the unfavorable direct labor variances, improved manufacturing processes and, where necessary, reset standards. These new standards were included in new products cost analyses and reflected in new selling prices where the sales member of management thought practical. With the break-down of the indirect labor classification, the production manager was able to control these costs, and to apply better inspection to prevent costly rework, better production control to eliminate excessive set up costs, down time and overtime.

Once more the results showed up in a better profit picture. The accountant returned to management with his proposal for outside help in restudying manufacturing expense rates and in the establishment of a budgetary control program. This time he won.

The Effort Pays Off

At the beginning, I stated that this article was intended for the accountants of small businesses. If any have been attracted and have read this far, I am quite sure that the problems and questions are familiar. Too many times I have sat in a conference in the early stages of such a problem and heard management ask such questions as "How much does product A or B cost," or "How much does our machine shop cost per hour," questions that could not be answered by the accountant. The information was lost in the burden of plant-wide manufacturing expense rates and poor labor reporting.

However, the accountant can begin to gather such information by simple changes in the apparently iron-clad chart of accounts. Through discussions with his plant or production manager he can determine the department or cost centers of the company. The weld shop, machine shop, assembly, tool and die shop, pattern shop, material handling, general manufacturing, occupancy, are just a few of the possible expense classifications. Service departments can then be redistributed to production departments by various equitable bases and departmental manufacturing expense rates developed. The plant manager can be of valuable assistance in developing the bases for the redistribution and the method of application of the rates, such as machine hours, direct labor, etc.

What I am trying to point out, is that a good cost system need not be an expensive or cumbersome project. With a little ingenuity and additional effort the accountant in the small business can furnish his management with just as valuable cost information and decision making tools as does his brother accountant in the large corporation with large cost departments and expert cost accountants and engineers.

Approach to Internal Control in the Savings and Loan Business

by JOE G. HARRIS

ALONG with the expansion of the savings and loan business during the past ten years, there has been an expanding recognition of the importance of internal control. Several factors have pointed up the importance of such control. Due to increase in business volume, management relies more upon reports that are submitted to it and, therefore, needs good internal control in order to place greater confidence in the report data that it receives. It has also become increasingly apparent that the primary responsibility for safeguarding the assets of an association and preventing and detecting errors as well as fraud, rests with management. It is only through maintaining a proper plan of internal control that management can meet this responsibility.

Audits, whether performed by governmental examiners or by private auditors, cannot be regarded as substitutes for proper controls.

Because of the cost, management will find it virtually impossible to devise a system of internal control that will meet all the requirements and provide all of the controls. Each association has its own problems and controls adequate for one problem may not suffice for another. Where the cost of controls outweighs the possible losses, the association may decide such controls are impracticable.

Establishment of internal control is not enough. Its operation must be continuously reviewed, for a system of internal control, regardless of its soundness at inception, will tend to deteriorate if not reviewed and appraised regularly.

What are the characteristics of a satisfactory system of internal control? Primarily they are:

1. A plan of organization which provides appropriate segregation of functional responsibilities.
2. A system of authorization and record procedures adequate to provide reasonable accounting control over assets, liabilities, income and expenses.

JOE G. HARRIS, Dallas Chapter, 1956, is with Peat, Marwick, Mitchell & Co., Dallas, Texas. He has lectured at Southern Methodist University in Dallas. Previously, Mr. Harris was associated in various accounting positions with the Ford Motor Company in Dallas, the Southwest District for the R.C.A. Service Company, Dallas, Texas, and the Lone Star Life Insurance Company, Dallas. He received his B.B.A. and M.B.A. degrees from Southern Methodist University and also attended Arlington State College, Texas A & M College, University of California and the University of Tennessee.

3. Sound practices to be followed in performing the duties and functions in each of the departments.
4. A degree of quality of personnel commensurate with responsibilities.

These four elements, while important separately, bear an inter-relationship to one another that is basic to proper internal control. Deficiency in any of them may hinder the successful operation of the system. For example, a plan of authorization and record procedure may not work properly if there are no qualified personnel capable of performing the necessary procedures.

Plan of Organization

One of the most important aspects of any plan of organization is the extent to which it provides organizational independence between the operating, custodian and accounting departments. By independence we do not mean to imply that barriers should be erected to prevent frequent consultation between departments. Such consultation is needed to devise methods of smooth paperwork flow and increase over-all efficiency of operations through integration and coordination of the work. The independence rests on the premise that no department should control the accounting records relating to its own operation. This is an extension to the department level of the principle that no one person should be allowed control of all phases of a transaction without the provision of a cross-check by another person or persons.

This independence or separation is necessary to prevent the possibility of manipulating accounting records, to the extent that detection of errors and fraud is extremely difficult.

Examples of proper separation include having a person responsible for prompt controlling of mail receipts who does not have access to the savings and loan cards. The cards can be posted later by the regular tellers or still another employee. Another person should prepare the bank deposit. The duplicate deposit slip which has been authenticated by the bank should be reconciled daily to the recorded receipts, by a person who does not handle the cash. Still a different person, or at least a person other than the one who makes the deposit, should reconcile the bank statement.

An internal audit staff can be used not only as a check on the accuracy of accounting data and the safeguarding of the institution's assets but also as an instrument of management in determining adherence to association policies. As mentioned above, internal control and audit control (either by internal auditor, CPA or governmental examiner) complement one another. However, we must

point out once again that the small association cannot staff itself for a great many divisions of duties; therefore, it can apply only as much internal control as is economically feasible at the time.

Assuming a proper functional division of the activities of an association, the next step is to establish responsibility with the divisions for their efficient operation. With the placement of responsibility must go the delegation of authority so that such responsibility may be met. Dual responsibility should be avoided wherever possible. Where the work of two or more divisions is complementary, as is very often the case, the responsibility for the several phases may be divided, so that the functions of initiation and authorization of a transaction, its recording, and the custody of the resultant asset are separated.

System of Authorization and Record Procedures

Once an appropriate plan of organization has been established, objectives have been determined, and management has delegated the responsibility for the attainment of the objectives, there must be provided a classification of accounts and records control. Classification of accounts, commonly referred to as a chart of accounts, is a guide in setting up general ledger accounts which are descriptive of the operations. A detailed explanation following the classification gives the proper charges and credits to be made to each account. The accounts selected and their sequence should meet the following tests:

1. Do they facilitate the economical preparation of financial statements and reports?
2. Are they needed to reflect adequately and accurately the assets and liabilities, and are the revenues, costs and expenses sufficiently broken down to be useful to management in control of operations?
3. Do they describe accurately and concisely what is contained in each account?
4. Do they delineate as clearly as possible the boundary lines between capital assets, inventories and expense items?
5. Do they provide for controlling accounts where necessary?

The Standard Accounting Manual for Savings and Loan Associations published by the United States Savings and Loan League covers adequately the basic principles of the classification of data within a formal structure of accounts.

Records control is established through the designing of proper records and forms and through planning the logical flow of the record keeping and approval procedures among the sections and departments of the association. Such forms and procedures should be incorporated in a procedure manual.

Procedure manuals need not be restricted to forms and paper flow alone. The manual may be expanded into an administrative manual including in its contents the association's objectives and broad policy, the organization chart, responsibilities, authority, limitations and relationships, job descriptions and personnel practices as well as operating procedures.

Each particular form or record should have certain characteristics which make for its serving a useful function in its relation to the procedures. It must be sufficiently simple so that it may be clearly understood and processed accurately, promptly, and at a minimum cost. It should be designed for all possible uses so that the number of different forms may be held to a minimum that is practicable. It should also be so constructed that proper handling will necessitate adherence to the control procedures set up, thereby providing a degree of internal check within the form itself.

Sound Practices

Sound practices may be called the necessary ingredient for effecting a plan of organization and the design of the flow of procedures. The soundness of practices followed in the performance of duties and functions in the association will largely determine the effectiveness of the internal control and the resulting efficiency in operations.

It is not the object of this article to enumerate all the practices which, under a certain set of circumstances, would be sound. However, a few illustrations will serve to clarify the meaning of sound practices and to distinguish them from authorization and record procedures. In the case of teller operations, the person in charge of procedures would supply the various forms such as deposit slips, withdrawal slips and cash report forms. He would also provide for orderly routing and handling of the related records. Practices adopted in carrying out the procedures would be largely determinative as to whether satisfactory internal control exists.

Sound practices would also require that each teller have a separate cash drawer provided with a lock and with the key in the teller's possession. Each teller should be provided facilities for locking up his cash if his change fund is not turned in at the end of the day. Certain types of window-posting machines provide locked-in proof tapes and certain other locked controls. These devices can be very useful internal control aids, provided that the keys to the locks are available only to persons who do not operate the machines.

Other examples of sound practices in this area would include balancing by the tellers at least once a day. The person responsible for checking out the

tellers should clear out the tellers' machines and balance the tellers' receipts with the totals furnished by the machines. Corrections and noncash items posted on the machines should be closely scrutinized. Even when tellers' receipts are checked by someone other than the teller, frequent unannounced checks of tellers' cash drawers should be made at varying intervals by someone who is not responsible for the collection of monies. The immediate endorsement of each check taken over the counter with the association's bank deposit endorsement stamp is a good precautionary measure. Not only will this practice aid in preventing misuse of cashed checks, but will render further negotiation impossible if the checks should be taken in a robbery. Under no circumstances should cashed checks be converted to cash to replenish a change fund.

Examples of sound practices in other areas include bank reconciliation by a person other than the one who makes the deposit, competitive quotations of prices on purchases, mandatory vacations, bonding of employees, etc.

The moulding of an integrated system into a smoothly functioning unit is an important feature of an adequate system of internal control. The installation of a system, good as it may be, does not assure that it will function smoothly on its own. Cooperation to a great degree is based on human relationships. Two people, competent in their own right, may not be compatible. Thus, management must keep tab on the internal conflicts arising from varying interpretations of authority or reluctance to yield authority as a matter of personal pride. Periodic conferences by management will provide a possible means of detecting such differences and perhaps also of rectifying them.

Adequacy of Personnel

A properly functioning system of internal control depends not only on effective organization planning and the adequacy of the procedures and practices but also on the selection of officers, department heads and operating personnel with ability and experience and who are capable of carrying out prescribed procedures in an efficient and economical manner.

The managing officer of an association has a dual responsibility to the members —to provide them with the best possible day-to-day service as patrons and to safeguard their funds. Since he will carry out these responsibilities to a great extent through association employees, the success of the procedures which he establishes and carries out will depend on the caliber and training of the employees.

Comprehensive interviews should be given to prospective association employees. Where aptitude tests are available, they may prove useful in arriving

at a determination as to the chance of success of an inexperienced applicant. Larger associations have set up specialized personnel departments. Acting on approved department requests, the personnel department, utilizing a variety of appraisal devices to judge personality, ability, etc., selects those applicants it feels best meet the requirements of the position. It is considered the best practice to have the department head requesting the employee make the final selection from among the applicants chosen. This stops any possible contention by the department head, as an excuse for poor performance, that the employee was forced upon him by the personnel department.

It should never be forgotten that a savings and loan association is an office where funds are handled. Although a custodial employee, for example, may never be involved in the handling of funds, his duties may give him access to funds, particularly if some internal control procedure is not strictly adhered to. A thorough check into the background, references and experience of each employee is therefore of utmost importance.

Adequate compensation of association employees is of utmost significance. Inadequate compensation may be a cause of small peculations which can ultimately lead to large losses.

There is a trend in the savings and loan business toward accepting the use of job classifications, job analyses and job descriptions. They are valuable in clearly delineating the tasks to be performed, the degrees of responsibility, and the manner in which the work is to be accomplished. Job descriptions, when properly drawn up, may also be used to acquaint one employee with all the other tasks performed in the association. This shows him the over-all operation as well as his own contribution.

Training of employees should be planned with a view toward making every employee as versatile as possible. He should be oriented with a thorough knowledge of the asociation's objectives and the services it renders. This will aid him in performing his work in the most efficient manner possible. Training should be carried on continuously. Although it will involve expenditures of time and effort, a properly administered training program will pay dividends in terms of efficiency and morale.

Internal Control and the Independent Public Accountant

Federally chartered savings and loan associations are required to have annual audits. This requirement may be met in one of three ways. The Federal Home Loan Bank Board examiners are required to make supervisory examinations approximately every 12 months. This examination may be extended to include

an audit. An FHLBB accepted internal audit plan may be adopted in lieu of external audit, or an independent CPA may be employed.

Many people talk about auditing a savings and loan association or examining it as if these terms were properly interchangeable. They are not. The examination seeks to ascertain: (1) that the association is conforming with the law, the rules and regulations and the by-laws, (2) that it is solvent and is following sound financial practices and (3) that its directors and management are conducting its affairs properly. In contrast, the objective of the audit is to test the integrity of an association's accounts and the accuracy of is records. Certified public accountants satisfy themselves as to the general fairness of financial statements and the supporting records. They do this in the following fashion:

1. By a general review of the accounts and records, and comparison of figures shown on the statements with the sources from which they are drawn.
2. By a study of the accounting procedures regularly followed and consideration of any departure from these practices.
3. By independent sampling tests—through inspection, correspondence, confirmation or other means—of the existing assets.
4. By application of various audit tests to determine, as far as reasonably possible, that all liabilities are reflected in the statement of condition in the actual or approximate amounts.
5. By analysis, tests and over-all review of the income and expense accounts.

While the primary responsibility for the establishment and enforcement of internal control rests with management, the degree to which internal control measures exist and are carried out is of great concern to the independent CPA. Therefore, the basic approach to an independent audit is a review of the internal control already existing in the association. The reason for this is that the scope of the audit is to a considerable extent based upon the degree of internal control existing in the asociation. Where the internal control is excellent, the various tests can be reduced to a minimum. On the other hand, where internal control is weak or inadequate, the tests must be extended.

The association receives a major benefit from this preliminary review of the internal control. That is, any spots of weakness in the internal control are normally passed on to the management for consideration and correction as it sees fit. Frequently, this is put in the form of a management letter directed to the board of directors which outlines the weaknesses in the internal control. This can be of tremendous value, both to the board of directors and to the management of a wide-awake association that is attempting to maintain the best internal control possible.

Cross Training for Developing Personnel

by EUGENE C. SCHUBERT*

IN TODAY'S complex business structure, if maximum efficiency is to be maintained, it is essential that personnel have a knowledge of the allied production fields. The trend is toward management's recognition of this fact, and we can expect the need for cross-training to grow.

When a cross-training program is first introduced, even on an informal basis, many problems are encountered. For example, employees from the production control section are sometimes brought in to the cost accounting section unexpectedly for a one-week training period in the cost accounting operation. Often this may be during the peak period, when insufficient time is available for cost accounting personnel to devote to proper training. The presence of the trainees also tends to impede normal operations. This situation can be met by conferences among the various department's managers for the purpose of developing a system for planning ahead for the cross-training sessions, both as to timing and to scheduling an effective program.

The principles evolved can be applied to most organizations. The first step is for each department manager to determine the periods during a month which would be most appropriate for conducting training sessions. Next, a proper training program should be developed by each department, and kept flexible enough to meet the needs of the particular group of trainees, depending upon the departments in which they are regularly employed. A sample schedule applicable to production control employees who are assigned to the cost accounting section for cross training is given below:

Topic	*Hours*
General orientation. Why cost accounting?	1
Specific cost accounting reports—their meaning and use.	6
The data behind the reports. Where it comes from. What it means.	10
The big picture—the integration of production control and cost accounting functions.	12
Test.	1
	30

The purpose of the test is to determine the effectiveness of the program and modifications that are necessary, to find what the trainee learned from the session, and to be able to

* Chief of Electronics Cost Unit, Maintenance Cost Section of Industrial Cost Branch, Accounting Division of McClellan Air Force Base.

grade his performance. The test should consist of about a hundred true or false questions, which should have the approval of the department head whose employees are taking the training course.

A well rounded cross-training program for personnel department, if carefully planned and scientifically administered, will pay off. It benefits employees in increased job satisfaction; it benefits management through more efficient operation.

More and more attention is being given to the psychological or human factors in industrial operations, especially by larger organizations. Over and above the basic physiological needs, provided for by the pay check, the employee's inherent needs for safety, affection, esteem and progression can be either satisfied or frustrated by the plant management.

Safety needs involve security and require that the employee know exactly what he is expected to do. He wants to know his personal position in the organization structure and how it relates to the other operations. The cross-training program, designed to acquaint him with the whole operation, helps in this respect, too.

The need for affection as it pertains to the employee, is fulfilled by a feeling of "belonging" to the company and by friendly relationship throughout the employee group. The need for esteem is difficult to satisfy in the specialized nature of modern industrial operations. The broadening of the employee's acquaintance with other groups and with other functions, and their acquaintance with him and his position, will contribute to the satisfaction of this need. With regard to progress, the individual must feel that he is in a position to exercise all his capabilities and that he has an opportunity to expand his area of responsibility.

These are all areas of research and development which are being studied by industrial leaders. Employee satisfaction contributes to good morale, which means efficiency and success to the company management. The cross-training program will contribute its share to employee satisfaction and morale, if it is installed with care and administered with confidence.

Beyond These Covers

Books

Accounting Systems — Principles and Methods

Cecil Gillespie, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, Second Edition, 1961, 641 pp., $12.

Significantly, the closing section of this thorough revision of a text first issued ten years ago is devoted to electronic data processing. System survey scope and methods occupy the initial portion of the book and are then related to the various accounting functions, including the reporting function.

Administrative Control and Executive Action

B. C. Lemke and James Don Edwards, Charles E. Merrill Books, Inc., 1300 Alum Creek Drive, Columbus 16, Ohio, 1961, 795 pp., $7.95.

A far-ranging book of readings (including NAA material) is embraced between the covers of this book—over 70 papers bearing on aid to administration. Decision-making, cost forecasting, inventory, and research and development are given topical emphasis among the papers relating to control. Among those relating to action, like topics include capital budgeting, pricing and break-even analysis.

An Introduction to Electronic Data Processing for Business

Leonard W. Hein, D. Van Nostrand Company, Inc., 120 Alexander Street, Princeton, New Jersey, 1961, 320 pp., $7.50.

A text for college students, material in this work advances by easy stages from the starting point of basic concepts and illustration to such closing topics as merging, collating, sorting—and report writing on the computer. Technical support to the expositions given is supplied in four appendices.

The Television Business

Wayde B. Ogden, Ronald Press Co., 15 East 26th St., New York 10, N. Y., 1961, 197 pp., $6.

The subtitle, "Accounting Problems of a Growth Industry," places this book in the center of the accountant's interest, for it relates the conditions of a familiar and spectacular industry with their interpretation in accounting terms. Chapter titles include "Understanding the Industry," "Accounting for Production Costs," "When to Record Revenue" and "Film Amortization Problems."

Income Tax Procedure

Niswonger and Bower, South-Western Publishing Co., Cincinnati 27, Ohio, Paper Bound, 1961, 260 pp., $4.20.

Covering personal, partnership and corporate returns in a concrete manner, this exposition also presents related procedural matters. These include tax withholding and estimating requirements. A final "unit" is devoted to "minimizing income taxes."

The Correct Cashier for Hotels and Restaurants

Janet Lefler and Salvatore Calanese, Ahrens Publishing Company, 230 Park Ave., New York 17, N. Y., Paper Bound, 1961, 59 pp., $2.

Devoted to the particulars of the cashier's work and function, this well illustrated exposition also casts about these duties some of the aura of the hotel industry as host to the traveller. Bill forms and ledger cards are included as exhibits, along with other forms and with half-tones of cash register and posting machines.

Tobé Lectures in Retail Distribution (1959-1960)

Harvard Business School, Boston 63, Mass., 1960, 125 pp., $3.

The half dozen lecturers, whose contributions to the whole combine to make this book, provide a wide range of observations concerning the field of retailing—its nature, prospects and related requirements of management. Action of government through the Federal Trade Commission is the topic of one paper, the European scene occupies another and "The Challenge of Management at Montgomery Ward" provides an area of particulars in the American scene.

Decision Models for Inventory Management

Robert B. Fetter and Winston C. Dalleck, Richard D. Irwin, Inc., Homewood, Illinois, 1961, 123 pp., $5.75.

The title of this volume is not misleading. The reader is brought face to face with the construction and use of models, together with the applicable mathematics. The objective is "the optimal inventory" maintained by "development of appropriate ordering rules."

Progress in Operations Research

Russell L. Ackoff, Editor, John Wiley & Sons, Inc., 440 Park Avenue South, New York 16, N. Y., 1961, 505 pp., $11.50.

A first volume in a project intended to improve the accessibility of writings already published on various aspects of operations research, this work groups eleven such papers. It opens with "The Meaning, Scope and Methods of Operations Research" by the volume's editor and includes papers on mathematical programming and inventory and replacement "theory."

Applied Statistical Decision Theory

Howard Raiffa and Robert Schlaifer, Harvard Business School, Boston 63, Mass., 1961, 356 pp., $9.50.

Mathematical methods are the substance of this work. They are presented and discussed as to validity and development, with much reference to statistical theories and theorists, as points of departure.

Industrial Purchasing

J. H. Westing and I. V. Fine, John Wiley & Sons, Inc., 440 Park Ave. South, New York 16, N. Y., 1961, 534 pp., $9.50.

An impressive pie chart (page 5) indicates how many sales dollars ordinarily go into purchases, and lends relevance to this revision of a book first published six years ago. Among the topics which the industrial accountant may also find of interest are consideration of make-or-buy decisions, scrap disposal, and evaluation of performance of the purchasing function.

Simplifying Unemployment Insurance Objectives

Harry Malisoff, Industrial Relations Section, California Institute of Technology, Pasadena, California, Paper Bound, 1960, 32 pp., $2.

This pamphlet deals with unemployment insurance policy, state and Federal, reporting experience and appraising the present status of this social experiment, now a quarter of a century old. Not an accounting dissertation, this presentation, nevertheless, deals with background to a cost sustained largely by industry.

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